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QUIZ-COMPEND

ON

SURGERY

BY

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Class of '99, Hahnemann Medical College, Philadelphia, Pa.

WITH THE COLLABORATION, ON

SPECIAL AND REGIONAL SURGERY

OF

RICHARD M. HAEHL, M.D.

Class of '98, Hahnemann Medical College, Philadelphia, Pa.

WITH A SECTION ON

VENEREAL DISEASES

BY

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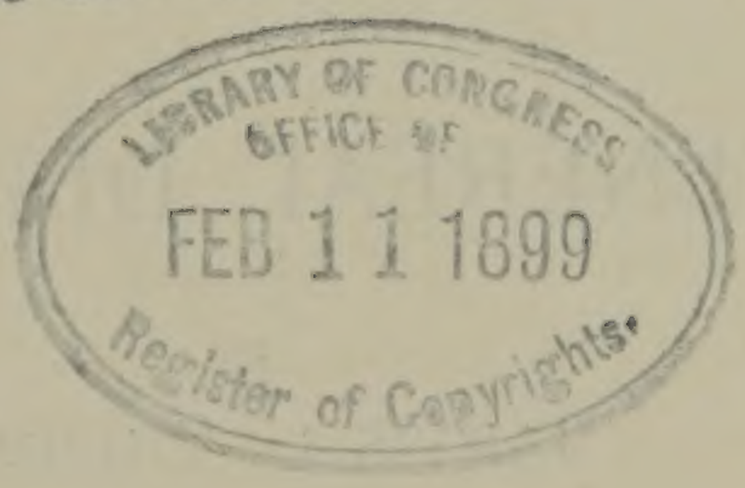
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PREFACE.

Having been repeatedly urged by the members of the Class of '98 of Hahnemann Medical College, Philadelphia, to publish the Institute Quizzes on Surgery, Richard M. Haehl, M.D., of the Class of '98 of Hahnemann College, and Quiz-Master of Surgery in the Hahnemannian Institute, proposed to the Editor of this work the publication in book form of all the quizzes given by him while serving in the above capacity. The proposition was accepted, believing that such a work would be valuable, not only to the Class of '98, but to succeeding classes as well, and to medical students generally. This conclusion reached, the idea suggested itself of including in the same publication, in a somewhat similiar manner, quizzes on the other branches relating directly to the general subject of surgery as taught in the Hahnemann Medical College of Philadelphia. The carrying out of this idea resulted in the following pages.

Dr. Haehl's quizzes are comprised in the section on Special and Regional Surgery. Some parts having been left unfinished, especially those treating of the surgical diseases and injuries of the respiratory and alimentary tracts and the chest, such additions were made as were deemed necessary. Then, the entire section was revised according to lecture notes and further additions made, thus rendering it complete.

The preparation of the section treating of Venereal Diseases was committed to Jarvis L. Thorpe, Class of '99 of Hahnemann Medical College, Philadelphia, and is entirely from his pen. His elaboration of the subject will be found clear and comprehensive, and will prove a valuable aid to the student. The Editor wishes to express his hearty thanks to Mr. Thorpe for his co-operation in writing this section.

Apologies are due, perhaps, to the medical profession at large for the publication of a work of this kind by an undergraduate; feeling, however, that the demand for some brief but sufficiently comprehensive manual, embracing the various divisions of surgery, as yet exceeds the supply, and realizing that

valuable time is consumed, mistakes made and important data omitted by students in taking notes, it was thought that an addition to the already large library of medical books might be risked, and, consequently this volume was printed with the earnest hope that it will fulfill its mission, viz., that of a companion to the medical student.

It is needless to say that such a work was not intended, nor does it presume in any way to usurp the place which any one of the valuable treatises on surgery now rightfully occupies in the student's course, the desire being merely that it should act as a substitute for the laborious though necessary task of note-taking. In furtherance of the object just mentioned, it has been the endeavor, in treating of the various subjects, to follow them, not only as arranged in the college curriculum, but also as closely as possible, with regard to the order of the lectures as delivered from the respective chairs. This was made possible only through the great kindness shown by Dr. William B Van Lennep, Professor of Surgery in Hahnemann Medical College of Philadelphia, and also by Dr. Gustav A. Van Lennep, Dr. Carl V. Vischer, and Dr. Leon T. Ashcraft, Lecturers on Surgery in the same institution, who endorsed the project by permitting free access to their own lecture notes, whose valued advice was a welcome and material aid in properly carrying the work to completion, and to whom the Editor wishes to hereby publicly express his warmest thanks. He would also gratefully acknowledge his indebtedness to Dr. Clarence Bartlett of the Hahnemann Medical College of Philadelphia, for his kindness in granting the use of his library and his otherwise generous and substantial assistance in the furtherance of the work.

In addition to the lecture notes, frequent reference was made to various text-books, among which are: The American Text-Book of Surgery, The Homœopathic Text-Book of Surgery' Dennis's System of Surgery, Reference Hand-Book of the Medical Sciences, Park's Surgery by American Authors, Senn's Principles of Surgery, Green's Pathology and Morbid Anatomy, Carleton's Genito-Urinary and Venereal Diseases, Fisher's Diseases of Children, Gray's and Morris's Anatomies, Wharton's Minor Surgery and Bandaging and the Hahnemannian Monthly. Acknowledgement is hereby made for all information gleaned from these sources.

SURGICAL PATHOLOGY.

BACTERIOLOGY.

What is bacteriology?

It is the science which treats of organisms that, under certain circumstances and conditions, give rise to morbid changes in the animal organism. Therefore it is the study of bacteria.

What are bacteria?

Bacteria are microscopic organisms that are classified as belonging to the vegetable kingdom. They consist of a mass of protoplasm and differ from animal cells in the fact that they have no nucleus. However, they often possess a cell membrane, which is believed to be nothing more than a condensation of the protoplasm. Some possess cilia.

Under what other names are bacteria known?

They are known as micro-organisms, microbes or germs.

What are the three principal forms of bacteria?

The bacillus, or rod; the coccus, or ball; and the spirillum, or corkscrew.

With what forms only does the surgeon have to deal?

With the coccus and the bacillus of the class known as schizomycetes.

How are bacteria classified according to their manner of growth?

Aerobic, those which require the presence of free oxygen for their growth; Anaerobic, those which germinate with an exclusion of oxygen; facultative anaerobic, those micro-organisms which grow or develop either in the presence of oxygen or its absence, in contradistinction to those known as obligative aerobic or anaerobic.

How are bacteria classified as to the substances upon which they live?

As saprophytes, those which live on dead organic matter exclusively, and as parasites, those which subsist on living organic matter. Parasites are classified as facultative parasites, those which feed on dead substances and can exist in the living tissues only at a certain stage of development; and as obligatory parasites, which multiply exclusively in the living tissues.

How are bacteria classified according to their individual habits?

Some bacilli have a tendency to form ribbons or strings, when they are known as the leptothotic variety. The cocci are often found in pairs and are then known as diplococci; and, again, when they have a tendency to form chains, they are known as streptococci, in contradistinction to those whose tendency is to form groups, the staphylococci. Four cocci arranged in the form of a square are a micrococci tetragones. An irregular mass of cocci, when at rest and held together by a viscid substance, is described as a zooglea.

What temperature is it necessary that bacteria have in order to live?

Bacteria rarely live at a temperature below 20 degrees C., or above one of 40 degrees C. The saprophytic bacteria live at a temperature between 20 and 30 degrees C.; whereas the parasitic variety live at

about the temperature of the body, viz., 37½ degrees C. Mature bacteria are always destroyed by a temperature of 77 degrees C., while most succumb to a heat of 50 to 55 degrees C.

How do bacteria propagate?

They multiply by fissure or segmentation, by the production of spores, or by both these methods. By fissure multiplication the cell elongates and a constriction appears in the center, which by becoming deeper and deeper, finally results in complete division of the cell into two equal halves, which in turn grow and divide in a similar manner. Thus a diplococcus is formed and then a tetragones, and so on.

In sporulation a certain part of the protoplasm becomes condensed in one portion or the other of the cell. This is the spore, it being recognized by a higher refractive power than the protoplasm itself. The spore ultimately finds its way through the cell wall, or the lining membrane disappears before it, and is set free. It soon grows to a full-fledged bacterium.

How do these spores differ from the bacilli which produce them?

They possess a greater power of resistance to germicidal agents. Some spores survive a temperature of 100 to 120 degrees C. and are not often destroyed by boiling for several minutes, and yield but slowly and frequently imperfectly to germicidal chemical agents. The spore is protected by a dense membrane, consisting in a desity of the protoplasm, and this is described by some as containing cellulose.

Mention some other properties of bacteria.

Some are possessed of motion. These are seen to have cilia, which are supposed to give the locomotive power. Some, however, without these flagella have the power of motion, which is dependent on the Brownian molecular movements. The above are chiefly of the saprophytic variety.

Some bacteria give rise to the production of pigment, and are known as chromogenic bacteria. The pigment is found external to the cell. The bacillus prodigiosis produces a beautiful red pigment.

The bacteria producing gas are known as gasogenic bacteria. This faculty belongs to the anaerobic variety particularly. Some produce pleasant and some disagreeable odors.

To what other substances do bacteria give rise?

To ptomaines. A ptomaine is a substance produced by the action of bacteria on the tissues, in contradistinction to a leucomaine, which is a compound resulting from tissue metabolism.

When and by whom was it demonstrated that bacteria are producers of disease?

It was discovered in the latter part of the seventeenth century by Devian, a Dutch observer. He found the bacillus anthracis in persons suffering from anthrax. By filtering the blood with these bacteria in it, it was found that the sediment, or the solid portion, only would produce disease.

What are Koch's rules as to the pathogenic power of any bacterial mass?

1. They must be demonstrated in the pathological product.
2. They must be capable of artificial cultivation.
3. When injected into the healthy organism it must produce the identical changes.
4. It must again be demonstrated.

Is it the organism itself, or the bacterium or the ptomaine that produces the disease?

There are good reasons for believing that, in some instances at

least, it is not the organism per se, and not the bacterium per se, but the ptomaines that produce the disease.

What is the other name for a ptomain?
Toxin.

How do pathogenic bacteria gain entrance into the body?
All disease must be considered as external to the body primarily, i. e., it must depend on some external condition. Hereditary diseases also depend upon some external condition. One source then is through hereditary disease, or hereditary predisposition. Syphilis may be hereditary, as is well known.

Pathogenic germs may be latent in an organism and not develop until they have the proper soil. They may be latent in healthy organisms, but as a rule these organisms are free from them. They rapidly become eliminated, depending entirely on the predisposition inherent. The germs are eliminated by the bowels, kidneys, skin, etc. Very often in predisposed individuals, when the germs remain latent, they develop after some slight cause; or, in a healthy person, the germs, introduced by some means or other, may produce disease at some localized point of weakened resistance.

Bacteria exists everywhere in the air, water and other substances, and are conveyed into the organism through the respiratory and digestive tracts, the skin, etc.

Are surgical diseases infectious or contagious?
In the majority of instances they may be considered as truly infectious in character, though in the strictest sense they are contagious diseases, i. e., communicated by contact.

By which variety of bacteria are diseases caused in the organism?
The parasitic variety or the pathogenic micro-organisms. The saprophytic or non-pathogenic variety do not, under ordinary conditions, produce pathological conditions in the animal organism.

What is the exhaustive theory as to the elimination of bacteria from the organism?
After the organism becomes invaded with bacteria, they propagate up to a certain point, and after consuming all the soil there is, for want of more protoplasm or suitable soil, they disappear.

What is the theory of phagocytosis, or the theory of Metschinikoff?
It is a well-known fact that certain cells possess the power of taking up foreign material, e. g., the amoeba. Metschinikoff carefully studied this, and applied it to the elimination or destruction of bacteria in the animal organism. The theory contends that tissue cells together with the leucocytes of the blood act as germicides upon bacteria and devour them.

What varieties of phagocytes are there?
Microphagi, or the leucocytes, and Macrophagi, or the fixed tissue cells. These phagocytes surround the bacteria and absorb them upon their entrance into the organism.

Mention the cells known to possess phagocytic properties.
Leucocytes, mucous corpuscles, connective tissue cells, endothelia of blood vessels and lymphatic vessels, alveolor epithelium of the lung, and the cells of the spleen, bone marrow and lymphatic glands.

What is hemataxis?
It is the technical name applied to the drawing of the phagocytic cell toward the bacterium.

Mention the theories respecting the blood plasma as being a factor in the elimination of bacteria.

It is claimed that the blood plasma is germicidal in its effects. It has recently been demonstrated that it is anti-bacterial in its action on anti-toxin.

What is antitoxin?

If a bacterium, in small doses in a pure culture, is injected repeatedly into an organism, that organism becomes, as it were, innocuous to the poison, and a time comes when even a large dose of the bacterium culture, which would ordinarily prove fatal, is negative in its result. These repeated injections give rise to the development of what is know as antitoxin. The organism which has been subjected to these injections is supposed to hold this antitoxin in the serum of its blood, and when this serum is taken out, in an aseptic condition, from the organism and injected into another organism suffering with the typical effects of the bacteria, it will annihilate it.

What particular bacteria are of special interest surgically?

The pyogenic bacteria, or those capable of producing pus. These are micrococci, generally speaking.

Which are the most important of the pyogenic micro-organisms?

The staphylococcus pyogenes aureus, the staphylococcus pyogenes citreus, and the staphylococcus pyogenes albus.

Wherein lies the difference between these varieties?

They differ only in the pigment formation. The aureus is characterized by a yellow color in the culture medium, the albus being white, and the citreus having a sulphur or lemon color growth, which resembles the aureus, but does not change into the gold-yellow color, which characterizes that variety on exposure to atmospheric air.

What are the properties of these staphylococci?

They liquefy gelatin. They grow at ordinary temperature, though better at temperature of the blood. They grow in any of the culture mediums, and are all amenable to the aniline stains. They are micrococci, and tend to form clusters, as their name implies. They grow along the surface of the cultures, and the puncture of the needle, and liquefy rapidly.

Where are these varieties found?

The aureus is invariably found in pus, as a pus producer in acute abscesses particularly. The citreus is found less often (in about 10 per cent of acute abscesses). The albus is seldom found alone in pus, but is more frequently associated with the aureus. It seems to have for its natural habits the epidermis. It gives rise to stitch abscess after operations, and is hard to get rid of, being in the hair follicles.

How do streptococci differ from staphylococci?

They resemble each other in their individual appearance, but differ in that they are found in chains, and not in groups, and they do not liquefy gelatin rapidly. They have no color and appear as little, smooth beads or points along a line of inoculation made with a needle point.

Where are the streptococci found?

They give rise to deep changes and are therefore found in deep inflammatory changes, e. g., those following the lymphatic channels. It is found in progressive gangrene.

What is the streptococcus erysipelatous?

It is a variety of streptococci found as a specific in erysipelas and

known as the erysipelas streptococci of Fuilsen. It differs from the streptococcus pyogenes in that its individual cells are larger.

Describe the gonococcus of Neisser.

This is a micro-coccus, and, as it occurs in pairs, it is a diplococcus. They appear as hemispherical bodies, with their flattened surfaces in apposition. They are found in clusters or clumps in pus corpuscles of gonorrheal pus in the mucous membrane of the urethra and the conjunctiva. They are a delicate micro-organism and hard to produce artificially, growing best on human blood serum, and then only superficially. To be characteristic, it must be found within the cell, otherwise it may easily be mistaken.

REGENERATION.

How does the process of regeneration differ in the young and in the adult?

In a young individual, before the complete growth is attained, the process of repair exceeds that of waste, and growth is the result. In the adult the process of repair balances that of waste. If the opposite happens, viz., the process of waste exceeds that of repair, the result will be atrophy. There is then an equilibrium between the process of regeneration and that of waste.

What is meant by regeneration?

It is the reconstruction of a lost part with a tissue identical to that which has been lost, e. g., a fracture in a bone is repaired or regenerated by bone tissue.

How do the various tissues develop?

They always develop from pre-existing tissue, and each tissue always produces its own kind.

How does regeneration take place?

It takes place by a process known as granulation, and the first step towards this process is cell proliferation, which depends on the inherent vegetative powers of the individual cells.

How do cells proliferate?

They may proliferate or multiply in one of two ways, either by direct or indirect cellular division. The indirect method is by karyokinesis, or karyomytosis, and is most important. Karyokinesis occurs whenever granulation takes place.

What is meant by the term "healing by first intention?"

It is an old term applied to the direct healing of a wound. The theory was advanced by John Hunter that if the edges of a wound should be accurately approximated (and all the structures separated by the injury), blood vessel to blood vessel, muscle to muscle, skin to skin, etc., direct union took place. This was only apparently so, for it was found that the wound healed by granulation, as did other wounds, excepting with a lesser amount of granulation tissue. All wounds heal by first intention, so called, unless suppuration takes place.

What is granulation tissue?

It is a mass of cells that originate by kayrokinesis, and blood which is necessary to the life and growth of the cells.

Describe the formation of new blood vessels.

They may come from pre-existing blood vessels, or grow by a process of canalization.

Describe the process of formation of new blood vessels from pre-existing blood vessels.

The capillaries and the other blood vessels become subject to a haemastasis by the development of a thrombus, which in itself is a sufficient stimulation to urge on the development of a new vessel. This plugging of the vessels starts the karyokinesis in the endothelial lining of the vessels and there is seen what is known as a bud appearing on the side of the vessel wall. This bud increases and cells are piled on cells and may join with others. Sooner or later an excavation takes place and the blood runs in. This may occur without any inflammation. Inflammation is absolutely unnecessary to the healing of wounds.

Mention some of the characteristics of granulation tissue.

It appears to the eye as a red, velvety mass, its redness being dependent on its vascularity. It is rarely over one-eighth of an inch thick.

In a deep wound, the lower cells develop into mature cells.

What is cicatrization?

It is the process of transformation of the embryonal cells in granulation, or scar tissue into permanent, fixed cells. The result of all granulation is a cicatrix.

Does regeneration occur alike in all the organs of the body?

No. The more highly developed the cells of a certain organ are, the less liability is there of getting complete regeneration. We would not expect it in the kidneys, lungs or brain. The result is scar tissue, which also results in the parenchymatous organ, from some acute disease. Some say that regeneration never takes place in brain cells.

Mention some of the tissues of the body in order of their power of regeneration.

Epithelial tissue, connective tissue, bone and white fibrous tissue, and the neuroglia, the connective tissue of the nervous system.

Mention some characteristics of new formed tissues.

The vascular loops, not being required after the maturity of the cells, we find that they diminish by the contraction of the full or mature cells. All granulation tissue contracts.

The scar is first first red and then pale, due to an increased and a diminished vascularity. Scars have a tendency to break down and ulcerate.

Describe the process of canalization.

There is an exudate of blood into a connective tissue space and the leucocytes here give rise to epithelial cells, which ultimately line this serous space and eventually connect with the blood vessels in the immediate vicinity, and angles are formed and a new vessel development occurs.

Define hyperaemia, plethora, anaemia and ischaemia.

Hyperaemia is the first elementary change in granulation formation. It is an increased quantity of blood in a part, or a condition of increased vascularity of a part.

Plethora is a condition of an increased quantity of blood in the body.

Anaemia is a diminished amount of blood in the body.

Ischaemia is a diminished quantity of blood in a part.

Describe the varieties of hyperaemia.

Hyperaemia may be of two varieties, viz: Active hyperaemia or engorgement, a result of an increased flow of blood to a part, and passive or congestive hyperaemia due to a retardation or a diminished flow of blood from a part.

What are the causes of hyperaemia?

The vascular system is governed by a distinct set of nerves, known as the vasomotor nerves. These nerves spring from the upper portion of the cord and are intimately related with the sympathetic system. In this way the changes brought about by emotions, e. g., blushing, etc., can be explained. Some say these nerves spring from the medulla, some from the cervical portion of the cord near the cervico-dorsal portion and others believe that they have their origin near the fourth ventricle. Some make their exit from the lateral columns of the cord and some from the posterior portion with the sympathetic.

What two classes of vasomotor nerves have we?

One class belonging to the spinal system of nerves entirely, and another class that are both sensory and motor in character, having an element of the sympathetic nerves in them.

What are peri-vascular ganglia?

Though they have not been demonstrated they have been seen in connection with glands of the small intestine. Their function is similar to that of the larger ganglia.

What are the vasomotor constrictors and the vasomotor dilators and how do these nerves act?

The vasomotor constrictors are nerves that act as constrictors of the blood vessels in contradistinction to those dilating the blood vessels, and known as the vasomotor dilators. The former are believed to be for the purpose of preserving the general vascular tonus of the vessels, while the dilators are supposed to act in an inhibitory manner to keep the vasomotor constrictors in check from over action.

How can the functions of these nerves be demonstrated?

Division of the sciatic nerve, for instance, is followed by a dilation of blood vessels, i. e., a hyperaemia of the part distal to the division, due to paralysis of the vasomotor constrictors. Subsequently these vessels become constricted again. As no union of the nerve takes place, there must be either paralysis of the vasomotor constrictors or an irritation of the vasomotor dilators, leading to a dilation of the vessel, which results in a condition of hyperaemia.

How are the hyperaemias classified as to cause?

As a hyperaemia of paralysis when the hyperaemia is due to a paralysis of the vasomotor constrictors; and as a hyperaemia of irritation when due to irritation of the vasomotor dilators.

Mention the symptoms of hyperaemia.

1. Increased quantity of blood, causing a redness of the part. 2. Rise in the temperature of the part. Aside from the dilatation and the increased rapidity of the circulation there is no change. 3. In passive hyperaemia there is sometimes a transudation.

How is the rise in temperature of a hyperaemic part accounted for?

The interior of the body is of higher temperature than the exterior, owing to the more rapid elimination of heat from the surface, and when more of the warm blood of the body is brought to the surface at a particular point elimination cannot be as rapid as from the surrounding surface, and the result is an increase in the local temperature.

Is hyperaemia a pathological condition?

It cannot be considered in the truest sense as a pathological condition. It is simply a physiological process, leading on to a pathological or possibly to a morbid one. It is usually but temporary in its existence and bears a close relation to inflammation.

INFLAMMATION.

Why is inflammation an important condition?

Because inflammatory change is a condition that underlies all other changes, with the possible exception of retrogressive changes, and even here it is frequently the primary cause.

Describe the various stages of inflammation.

1. A contraction in the vessel walls, due to irritation of the vasomotor constrictors.

2. Dilatation, rapidly following contraction, with an increase in the rapidity of the blood flow or a hyperaemia.

3. The vessels apparently increase in number, or, rather, vessels before unnoticed become visible by being over-filled with blood.

4. Retardation of the current, with changes in the current, the vessels becoming filled with blood cells.

5. Stagnation or stasis takes place in the veins first, then the capillaries and then the arteries.

6. Changes in the blood stream. The plasma, normally occupying the periphery of the stream, becomes filled with the cellular elements (particularly the white blood cells), which ordinarily occupy the axillary portion. Then the white cells adhere to the walls and the stage of peripheral disposition takes place.

7. These leuocecytes by their amoeboid motion pass through the vessel wall. This is known as "emigration." By throwing out projections they attach themselves to the vessel wall and pass through by a transudation of the cellular elements. This occurs particularly in the capillaries whose walls are nothing but endothelial cells closely packed together. Between the cells are the stigmata, which during hyperaemia become stomata and permit of the exit of the blood cells. The red blood cells also pass through the stomata in the vessel wall, and this process is known as diapedesis. The serum also escapes and fills the connective tissue spaces.

What are the causes of inflammation?

There are several theories on the subject. All believe the changes are inherent in the blood, some that it is through some change in the fixed tissue cells or in the blood vessels themselves.

What are haematoblasts?

They are the third blood cells described, or the blood placques or blood plates. They are somewhat smaller than the red cells and much more numerous and contain a large amount of fibrin.

What relation do these haematoblasts bear to inflammation?

One blood theory of inflammation depends on the belief that there is a change in this third cell, causing a tendency toward coagulation of the blood, which leads to damage to the vessel wall with subsequent changes.

What is the most generally accepted theory to-day as to the cause of inflammation?

That the primary change occurring in inflammation lies in the vessel wall, that there is an enervation in this vessel wall and the cementing substance of the capillaries.

What are the other causes of inflammation?

Any cause which is sufficiently irritating to stimulate the tissue cells on to active function or formative function. The causes are traumatic. This does not necessarily imply a mechanical traumatism, i. e., an external injury; but any mechanical interference of the proper nutriment of the vessels.

What follows emigration and diapedesis?

Exudation, or the infiltrating of the connective tissue and lymph spaces with the serum and cellular elements of the blood.

What follows this exudation?

The leucotytes become farther and farther removed from the original point by virtue of their amoeboid movements. This results in a repulsion by the fixed tissue cells which are lead to an increased formative action, and these cells in the vicinity of the inflammation proliferate, resulting in a number of embryonic tissue cells. This is Nature's effort on the part of the organism to repel the intrusion of the bloody exudate.

What becomes of these embryonic cells?

They either attain their majority and we have normal cells, or else where the inflammation is severe these cells have no opportunity of developing and are destroyed and become a part of tne exudate.

What results when the inflammation is severe?

Not only do the serum and red blood cells and the leucocytes escape from the blood vessels, but also the haematoblasts. And where the changes are most acute there is a complete rupture of the vessels and the abundant amount of the colored corpuscles escaping is called rhexis.

What is the process known as resolution?

Resolution begins by the circulation becoming more normal in rapidity, and exudate being taken up by the blood vessels or the lymphatics, the part resuming its normal appearance in a short time.

What results when resolution does not occur?

There is an increase in the cellular proliferation and in the exudation, and a substance develops which is known as pus,, in short, tissue destruction.

What occurs when the inflammation is more chronic?

The greater chance these tissue cells have for taking an active part and for reaching their majority, the greater is the peripheral disposition or the chance for a limitation of the inflammatory process.

Give a definition of inflammation.

It is a complex change depending upon conditions both in the blood vessels and in the tissues. The more acute the inflammation, the greater are the changes in the vessels; the more chronic the inflammation, the greater the changes in the tissues.

Give the four cardinal symptoms of inflammation.

Redness, swelling, heat and pain. There may be added also for a fifth symptom a changed function.

How can these symptoms be explained?

Redness depends on much the same condition as hyperaemia from an increase in the quantity of blood in the exudate. Heat is explained on the same principle as hyperaemia, plus an increased tissue metamorphosis. The swelling is caused by the increased blood supply, resulting in an exudate. It depends both on the severity of the inflammation and the tissue involved. The pain results from the swelling in that it causes pressure upon internal nerve filaments or involves the nerve itself.

To what is inflammation always due?

It is always due to some septic process or infection, and this in the majority of cases is due to bacteria or their ptomaines.

How is inflammation classified pathologically?

According to the character of its product. When mucus is produced it is a catarrhal inflammation. When pus is produced it is called a

suppurative inflammation. When the product is a slough or increased tissue the inflammation is called phlegmonous. When there is much exudate of blood it is known as a hyperaemic inflammation. When serum is the product we have a serous inflammation; when fibrin, a fibrinous inflammation, etc.

Differentiate between a simple and an infective inflammation.

An inflammation is simple that has but a slight degree of severity, the cause being rapidly removed and the process of regeneration occurring soon in contra-distinction to an inflammation whose product is pus and which is known as an infective inflammation.

Give the other names for simple and deep inflammations and describe these inflammations.

Interstitial and parenchymatous. An interstitial inflammation is one of the foundation structure of an organ or the connective tissue forming its framework, while a parenchymatous inflammation is one in which the parenchyma of an organ is the seat of the inflammation, as when the secreting glands of a structure are implicated from the beginning.

What classification of inflammations has been made with reference to the character of the inflammatory change?

They have been classified as acute, sub-acute and chronic.

In an acute inflammation the exudation consists principally in an accumulation of corpuscles that have passed through the vessel walls and are, therefore, extra-vascular. In a chronic inflammation the elements are derived almost entirely from the fixed tissue cells.

Describe a haemorrhagic inflammation.

It is one of the most violent character, where the exudate is composed of blood in its entirety, where the condition known as rhexis takes place. It may occur as a very acute inflammation in the more violent infectious diseases such as small pox or black measles. It is clinically important as it interprets serious lesions. It also accompanies malignant diseases or those of specific nature. In a hyperaemic inflammation of the pleurae we would expect pneumonia.

Describe suppurative inflammation.

It is that variety of inflammation whose product is formed into pus.

What is a catarrhal inflammation?

It is a surface inflammation of the mucous membrane in which there is an increase in the physiological product of the mucous glands. By secondary changes this product may become suppurative in character and is then known as muco-purulent. Here we have in addition to the proliferation of the mucous cells, a destruction of the tissue cells together with leucocytes and pus.

Describe a fibrinous inflammation.

This variety of inflammation usually occurs in a serous membrane. The third blood cell is found here exercising its function and, owing to its degeneration, fibrin ferment is being set free. This contains fibrin which forms the coagulum. These masses of fibrin frequently form the foundation for the development of new tissue. New embryonic connective tissue cells are found in the meshes of this new tissue, and unless infected by a pus micro-organism they will develop into mature tissue and result in adhesions. When the inflammation is of a severe grade there occurs also a transudation of the serum of the blood. When the serum is in excess the inflammation is called sero-fibrinous, and when the fibrin is in excess, fibrino-serous.

What is understood by a phlegmonous inflammation?

It is that severe grade of inflammation in which the exudate becomes so excessive in quantity that it packs the lymph spaces and increases a destruction of the tissue en masse, which comes away in a slough as is typically exemplified in an ordinary furnucle or boil. This slough is not pus, but a mass of hardened tissue called the core. This would result ultimately in necrosis.

What is a croupous inflammation?

It is an inflammation characterized by the formation of a false membrane. It is a coagulative necrosis. It is typically exemplified in diphtheria. It is gangrenous in quality and may attack any mucous membrane.

Describe acute and chronic inflammations.

Acute inflammation depends for its activity upon the activity of the cause. It varies in degree from a condition where all the classical symptoms are clearly exemplified to one of less degree, that is chronic. In a chronic inflammation the changes occur principally in the tissues, The exudate is but trifling in amount, and in place of it there is an infiltration which results from the tissues arising from the cellular proliferation. The inflamed areas become infiltrated with these proliferated cells, which, unless some element interferes, have an inherent tendency to go on to the development of the mature tissue. When this new tissue does occur as the tendency is, it is known as an inflammatory hyperplasia, viz.: a numerical hypertrophy of the part.

The diseases classified under the term granular are examples of this form of inflammation. This is typically exemplified in tubercular inflammatory changes where the young cells develop so rapidly that they form a granulum which differs from the granular tissue of repair or regeneration in that they stop at the fibro-plastic stage. The cells are usually multi-nucleated, and instead of proceeding on through the development, retrogressive changes take place usually at a point farthest from the periphery due to the fact that they do not get enough nourishment at this point. The change that occurs is usually fatty in character, unless there is an infection with pyogenic micrococcus.

What is the prognosis of inflammation?

It is very variable, depending upon (1) the acuteness of the inflammation, (2) on specific cause, (3) upon the tissue involved.

What are the general symptoms of inflammation?

The general symptoms are secondary in nature and are in a direct ratio to the local changes. They are, rise in temperature, resulting in fever, and, being dependent on the absorption of the fibrin ferment, subsiding as the local change disappears, or due to the absorption of the ptomaines, the products of bacteria. This may result in a septicaemia if the tissue resistance is weakened and the bacteria are found throughout the system. Still more profound changes may come on and result in a pyaemia.

Accompanying the fever are other symptoms, such as headache, general lassitude, anorexia, and constipation or diarrhoea.

Tell how the symptoms vary according to the tissue involved.

In a superficial inflammation all the classical symptoms may be present, while in the fibrous structures, as bone, the changes are less rapid in character and are manifest simply in secondary symptoms, or in a collateral oedema, e. g. tissues of the thigh, in osteo-myelitis, and oedema of the lids.

Describe the treatment of inflammation.

Prophylaxis is the most important factor in the treatment; it is done by carrying out the rules of asepsis and antisepsis. In superficial

inflammations, injections of disinfectants can be used and thus no chance for infection occurs and no sign of it appears in the reparative process (5 per cent. solution of carbolic acid). In a profound inflammation this is unpracticable, as the bacteria are not so easily destroyed as the tissues and a wide destruction of tissue results.

Blood letting can be done in superficial inflammations at the site of the inflammation before stasis has occurred. (It should not be employed at any other part than the one inflamed, as it would lessen the arterial tension and make it still more impossible for circulation to continue in the inflamed area.) Its object is to give back the tonus to the vessel walls and to bring more leucocytes and blood serum to the scene of the change. In the early stages of inflammation cold, applied to the part in the form of an ice bag, is indicated. This not only causes a contraction of the vessel walls, but inhibits the action of bacteria.

When an exudation has occurred, heat is requisite to stimulate the development of a collateral circulation. This may be applied in the form of a hot-water bag or hot bichloride, or hot-water and carbolic compresses, or acetate of alumina. Never use flax-seed poultices. They are hot-beds for bacteria. Cold is indicated in redness, swelling and pain; heat when there is an engorgement and the part is blue or purple.

How does inflammation terminate?

In resolution, suppuration and in destruction or necrosis.

Upon what does the termination of inflammation depend?

It depends on whether the exudation is excessive enough to produce necrosis by actual pressure or whether it is to a less degree and results in liquefaction and putrefaction dependent usually upon ptomaines.

What is the effect of lessening the arterial pressure as a treatment for inflammation?

It was at first thought that anything lessening the pressure would be of benefit in treating inflammation, but later this was found to aggravate the condition. It encouraged stasis, which should be avoided.

How often should heat be applied and what are its dangers?

It should be applied as a cloth or gauze dipped in the hot solution and covered when applied by a piece of mackintosh. This may be done twice a day. Oftener may result in a devitalization of the tissues and encourages suppuration. Heat encourages a multiplication of germs.

What should be the chief aim in treating inflammation?

To bring about a state of physiological rest. If a limb be the seat of the inflammation, splints and elevation of the part will bring about this rest. If internal organs are affected they should be allowed to rest, e. g., stomach affected, no food should be placed in, but patient fed per rectum. In an inflammation of the eye a dark room should be used, etc.

How should the general condition of inflammation be treated?

In cases of protracted inflammation stimulation is indicated. Place the patients on stimulating diets, e. g., milk, concentrated beef broths, prediges ted foods, etc. Alcoholic stimulants also may be given, milk punches, champagne, etc. In more chronic inflammations, massage develops a collateral circulation. Counter-irritation may convert a chronic inflammation into an acute by developing an area of active tissue proliferation and starving out the granulation tissue. This may be done by the hot iron.

Parenchymatous injections are of value often, e. g., iodoform emulsions in tubercular changes in the knee given under thoroughly anti-

septic precautions. Iodoform emulsion is of great value in local tubercular changes.

Describe the treatment of pain in inflammations.

Where incision, heat and cold do not relieve, anodynes may be resorted to. These should be given in large enough dose to relieve for a long time rather than in small doses at repeated intervals. Drugs: Coal tar products, phenacetine, ½ drachm doses, also acetate of alumina in 5-7 gr. doses. Morphia, ¼ gr. in four teaspoonfuls of water, a teaspoonful every five minutes, or give hypodermatically.

In the early stages of inflammation, aconite, belladonna and rhus may be used as indicated. In chronic inflammations, iodide of arsenic, iodide of potash, arsenicum album. and the mercuries, especially the iodide of mercury. Lime preparations, especially calcarea phos. Tonics are also good, e. g., chloride of iron, cod-liver oil.

What can be said of the remedies for fever?

Antipyretics are useless, as the fever subsides with the subsidence of the inflammation. Quinine is the best remedy in this connection. Give it in the early stages in good-sized doses, not less than 5 grs. at a time. It favors the circulation.

Mention some local remedies for pain?

Chloroform liniment or lead acetate, 1 ounce; tincture of laudanum, 1 ounce, to water, 1 pint.

Arnica locally is helpful in bruises not susceptible to other changes.

NECROSIS.

Describe the termination of inflammation known as necrosis.

Necrosis surgically means a death of bone, and of internal soft tissues that are not exposed to putrefaction. It occurs as a result of inflammation when the inflammation is of such a degree as to make reaction impossible. It consists in the death of innumerable groups of cells at the same time.

What is necrotic atrophy?

It is a condition in which the process of waste in tissue cells exceeds that of repair, resulting in a death of individual cells; this process not being the result of any local cause.

Give the causes of necrosis.

An acute inflammation where the bacteria acting mechanically by their presence and by the rapid development of their products cause death of tissue, en masse. The main cause is an interference with the nutrient supply of the part which comes through the blood vessels. Disease of the blood vessels themselves, the destruction of the endothelium of the intima. Changes resulting in calcification and atheroma. Interference with the circulation through encroachment upon the walls of blood vessels or disease of blood vessels at remote parts resulting in thrombi and emboli.

GANGRENE.

What is gangrene?

It is a necrosis of superficial structures resulting from an interference with the blood supply to a part caused by a thrombus or an embolus.

What is senile gangrene?

It is dry gangrene or mummification. It usually occurs in a diseased condition of the arteries, with an enfeebled heart, changes very

common in the aged. It usually occurs in the extremities, where the circulation is poor, particularly in the feet. It rarely occurs before the age of fifty and usually between the ages of seventy and eighty. It comes on spontaneously or from some slight bruise and is due to an embolus or a thrombus.

What are the symptoms of senile gangrene?

They differ as to whether it is a result of the arterial circulation being cut off by an embolus or whether the venous circulation by a thrombus.

When an embolus is the cause, the blood of the part has been carried away by the veins and the extremity becomes dried up. There is no swelling and the limb is pale. This paleness gradually gives way to a discoloration due to an exudation of the blood that is in the tissue. This discoloration gradually becomes an absolute black and the parts shrivel up. Frequently reactive changes take place at the seat of obstruction, resulting in a line of demarcation and showing what tissue still receives blood supply.

When a thrombus is the cause, return circulation is obstructed, flow in the part continues, but cannot get away, and, as a result, there is, first, a transudation through the vessels and later on through the arteries themselves into the tissues. This results in oedema, swelling, discoloration, which is mottled, ecchymosis, then bullae due to an exudation of the coloring matter of the blood and finally there are developed superficially blisters. The entire part is thus filled with fluid, offering a most favorable field for the development of bacteria. Then putrefactive changes occur and moist gangrene results. This differs from dry gangrene in that putrefaction has taken place. The dry gangrene is clean, odorless and crumbles. The moist is dirty, does not crumble and has a fetor, which increases as the obstruction advances, and also has a tendency to spread, which is not often the case in dry gangrene.

What is decubitus gangrene?

It is a local gangrene resulting from a mechanical interference with the circulation, e. g., bed sores. It occurs in individuals of a low degree of vitality, who are emaciated and have bony prominences, and who are required to have absolute rest in bed. Bed-sores occur especially over bony prominences, e. g., elbows, ischia, heels, etc., and are due to direct mechanical interference by prolonged pressure on the area. Decubitus gangrene also develops in those suffering from specific lesions, who are obliged to remain in bed.

What are the causes of gangrene?

Mechanical, chemical and thermal. A burn is a mechanical cause, as is also an interference with the blood supply. Gangrene will occur in tissues that have undergone traumatism. Where the traumatism has been of sufficient degree of severity to obliterate the nutriment of the part for an indefinite time. Circulatory disturbances are the most potent in causing gangrene. They result usually from previous pathological conditions in the vessel walls, e. g., such as might be caused by syphilis.

What are the results of moist gangrene?

The putrefaction results in the development of gases and then the condition is known as a gangrenous emphysema. Following this through the action of the absorbents a septicaemia occurs.

What is a neuropathic gangrene?

It occurs as a result of spinal cord lesions or diseases or injuries to the nervous system. It develops rapidly and is thought to be due not only to the direct pressure exerted in these cases, but to inaction of the

trophic nerves. It may occur from a simple rubbing together of two portions of the body.

Describe the variety of gangrene called noma.

This is a gangrenous stomatitis and develops, as a rule, following acute infectious diseases in children. It first appears as a redness in the cheek, which turns to a dark color and spreads, rapidly involving the entire cheek, and then the palate, and, if the patient survives, destroying the soft structures to the bone. Schimmelbusch demonstrated bacteria in the periphery of the lesion. Extreme symptoms of acute rapid septicaemia are present in the last stages.

Treatment: Extensive plastic operations.

Describe gangrene from ergot poisoning.

It usually presents itself as a moist gangrene, occurring in individuals from eating diseased rye. It is due to a permanent contraction of the arterioles by this drug.

What is symmetrical gangrene, or Reynaud's disease?

It is a gangrene insidious in character, affecting the fingers usually, in young people between the ages of eighteen and thirty, usually females. Patient complains of a dead finger for a year or so. This gradually gives way to gangrene. It is believed to be due to changes in the centres of the vasomotor system of nerves, resulting in a tonic spasm of the blood vessels. It is similar to erythromelalgia, a disease attacking the lower extremities and spreading rapidly up the limbs.

What is ainhem?

This is a gangrene of the little toe, hereditary in character. It develops as a constricting band, as though a ligature were around the toe. This becomes tighter and tighter till the toe hangs by a small pedicle. It has been noticed in Hindoos, Cubans and inhabitants of Eastern Europe. It is thought to be due to a hyperplastic condition of the true skin and from vasomotor changes.

Describe diabetic gangrene.

It occurs in diabetic individuals. It results from an abrasion which forms the direct seat of the gangrene, or it may occur spontaneously. Such individuals are subject to gangrenous changes elsewhere, e. g., carbuncle, etc. Any wound takes on a gangrenous character.

Caution: Examine urine for sugar before operating such a case.

What is hospital gangrene?

It is a form of gangrene that occurred epidemically in hospitals before the introduction of antiseptic measures. It spreads very rapidly.

Describe perforating ulcer of the stomach.

This is a localized gangrene of the stomach, usually triangular in appearance, resulting from changes in the blood vessels. A triangular portion supplied by an end artery becomes anaemic and necrosis occurs. The stomach digests this necrotic tissue and an ulcerated surface results.

Describe perforating ulcer of the foot.

This usually follows some abrasion and is usually found in those who are in a run-down condition. It is presumably due to a neurotic condition, nerve changes, and is suggestive of some nerve lesion.

What is the prognosis of gangrene?

It varies greatly, depending on the etiology, location and extent of the disease causing the gangrene. Gangrene in an aged individual with weak heart action and atheromatous blood vessels predicts a bad prognosis. Gangrene as a complication in a young person as a direct result of a tubercular diathesis insures a more favorable prognosis.

Gangrene as a result of the obliteration of the main artery of a limb is fatal from sepsis, unless amputated early. In moist gangrene of internal organs the prognosis is very bad.

Much depends on the condition of the individual, the manner of treatment and the degree of blood poisoning that exists.

Describe the treatment of gangrene.

Prophylactic: In the aged, encouragement of circulation by stimulants and local applications.

When due to thrombosis (moist) elevate the limb and apply heat to encourage the development of collateral circulation.

Prevent any complications by keeping the part perfectly aseptic under all circumstances, using antiseptic applications that are not toxic in character. Use carbolic acid guardedly, as it tends to produce gangrene, particularly in the young.

Boric acid, salicylic acid and formalin (weak solution) are very satisfactory.

In decubitus, bad sores must be anticipated by bathing regularly the parts exposed to irritation with alcohol or a weak solution of formalin to tan the skin and by preventing pressure with air cushions. Keep the parts thoroughly dry with toilet powder, etc.

General treatment: Symptomatic in character, though remedies are of little avail. Stimulating diet. To diabetic patients prescribe an antidiabetic diet.

Operative treatment: In dry gangrene you can wait for the line of demarcation, but in the moist variety this would be fatal. In either case it is best to operate at once to prevent septicemia.

In dry gangrene amputate just within the line of demarcation, unless obscure, when, if the redness extends on the dorsum of the foot, amputate some distance above, the rule is above the knee. Age of patient and degree of septic intoxication may contra-indicate operation.

In noma, remove the gangrenous area, curette thoroughly, and cauterize with a hot iron. This may not stay the process. Strong antiseptic solutions are necessary. In less severe forms the acetate of alumina is a strong disinfectant and non-toxic.

SUPPURATION.

Describe another termination of inflammation known as suppuration?

Suppuration is a transformation of the products of inflammation into pus.

Describe the pus occurring in suppuration.

It depends on the severity of the inflamation more than on the character of the micro-organisms at work, i. e., upon the amount of exudate. There are various kinds of pus, then:

1. Pus may be thick and creamy and yellow in color (healthy pus, laudable pus).
2. Pus which is thin and intimately mixed with blood is called sanious pus.
3. Containing few pus-corpuscles and resembling serum it is called serous pus.
4. Pus where putrefactive changes are occurring rendering it fetid is called fetid pus.
5. Pus mixed with tubercular products is tubercular pus.
6. Mixed with mucous, muco-pus.
7. If the cellular elements are in a minority it is called a sero-pus.

What is pus?

Pus is a fluid or some liquid substance that results from a condensation of the inflammatory exudate that results from the peptonizing action of pyrogenic micro-organisms. Allowed to stand in a test tube for some hours it will be found to consist of two parts, a solid portion, precipitated to the bottom and a fluid portion. The former consists of the cellular constitutents of the exudate, viz., leucocytes, inflammatory cells, proliferated cells from the fixed tissues. The latter portion of pus-serum contains albumin, pyine, occasionally chrondrin, glutin and leucin; fatty matter and inorganic substances. The specific gravity of pus varies from 1019 upward. It is alkaline in reaction usually and of a peculiar, sweetish odor. Its reaction may be acid.

For descriptions of staphylococci pyogenes, aureus, citreus and albus, and the streptococci, the streptococcus erysipelatous, and the gonococcus of Neiser, see index.

Describe the bacillus pyocyaneus.

It is a chromogenic, short, thick, rod-like microbe. It gives a greenish-blue color to the pus. Its pyogenic properties are below those of the varieties described. Fluegge asserts that it is devoid of pyogenic properties.

What is the bacillus pyogenes foetidus?

It is similar in form to the above, being a thickish-looking rod with the property of developing gas (gasogenic properties). It is found particularly in those suppurative inflammations that are accompanied by the production of fecal pus, such as is found in ischio or peri-rectal abscess.

Upon what does the degree of suppurative inflammation depend?

The quantity of pus formation or infection. Therefore, on the character of the infection, the tissue involved and the inherent resistance of the tissue itself.

How is suppuration classified clinically?

As acute, sub-acute and chronic, depending entirely upon the degree of inflammation that gives rise to it.

Describe the process of an acute suppuration.

The same symptoms are present as in acute inflammation. An exudate occurs, the lymph spaces become packed with leucocytes, some proliferated tissue cells, etc., and the plasma circulation is cut off by pressure and stasis results. Destruction from pressure, necrosis, and then the reaction of the bacteria occur, after which liquefaction comes on at a point farthest from the nutrient supply, or the blood (the centre of the exudate). Then a softening takes place in the direction of least resistance, viz., about the circumference of the exudate. The tissue and exudate in this vicinity becoming liquefied, the softening increases. From this acute degree the suppuration can go on to sub-acute and chronic forms.

Suppuration occurs most typically in the connective tissues (being elastic). The leucocytes are gradually liquefied by the action of the bacteria and ptomaines are produced. These are spread out into other areas, preparing new tissues for the favorable development of bacteria. This may continue indefinitely until a tissue with a superior resistance is reached and tissue proliferation causes granulation, which limits the suppuration.

How does suppuration proceed in the chronic variety?

The process is identical to that of the acute variety, except that it is tardy in its development of granulation tissue and contains a larger quantity of embryonic and fixed tissue cells than the acute.

How does suppuration take place in the mucous membrane?

It occurs in the same manner as the above. The first changes are an increase in the physiological functions of the mucous glands, a pouring out, then, of an increased quantity of mucus. The mucus, epithelium and some mucous tissues become packed with leucocytes, and a coagulum of mucus occurs, which results in pus.

By what are suppurative inflammations occurring in the physiological cavities known?

Such suppurative inflammations are known by the prefix pyo—e. g., suppurative inflammation in the pleural cavity is known as pyothorax, in the pericardial sac as pyopericardium.

ABSCESS.

What is an abscess?

An abscess is an acute suppurative inflammation, local or diffuse in character, occurring in the tissues. When localized it is called a circumscribed collection of pus. Clinically abscesses may be described as acute and chronic.

From what does an acute abscess result?

It results from the infection of pyogenic micro-organisms, almost always due to the staphylococcus pyogenes aureus. This bacterium has a much greater tendency to localization in tissues than has the streptococcus, which is usually found in the more diffused and superficial varieties of inflammation.

How does an abscess develop?

The presence of the staphylococcus gives rise to the condition known as inflammation, and the changes which occur in all inflammations as described above. The exudate breaks down at a point, or there may be different foci of liquefaction occurring at the same time, which, if subcutaneous, may rupture superficially, as in carbuncle.

Upon what does the size of an abscess depend?

First, upon the virulence or degree of the inflammation, and, secondly, upon its anatomical site. Where it occurs in a loose tissue, there will probably be a greater involvement of the tissue than would occur in dense and less elastic tissues.

Describe the clinical manifestations of an abscess.

(1) Those common to any acute inflammation. They may all be present, or some may be lacking. and others intensified, depending entirely upon the tissue involved and its anatomical site, e. g., an abscess developing in an elastic tissue, not freely supplied with nerve filaments, is not accompanied by as much pain as an abscess occurring in dense structures. A felon is a very limited inflammation, yet occurring in dense structures freely supplied with nerve filaments, it is accompanied by much pain. Conversely, an abscess developing in the back, thigh or shoulders, where there is abundant connective tissue and a chance to expand, has much less pain.

(2) Softening of the inflammatory infiltration discerned by the sense of touch, passing the finger over the lesion through its various diameters. Palpation then gives fluctuation. The softened area is found about the centre of the abscess.

(3) General symptoms, depending on the severity of the local symptoms, being either in direct or in indirect proportion to them—e. g., a small quantity of pus that is highly absorptive may cause general symptoms all in proportion to the local manifestations. On the other hand

(and this particularly true in the more chronic abscess developments), the general symptoms are out of all proportion to the local ones. These general symptoms are fever, anorexia, headache, etc.

How is an acute abscess diagnosed?

There are present the symptoms of an acute inflammation, plus the physical signs of infiltration; redness, hardness and the subsequent softing.

With what may acute abscess be confounded, and how can a differentiation be made?

Abscess may be confounded with any swelling having the symptoms of acute inflammation, its period of duration being from four to ten days. Also with a hernia, an aneurism, an angioma or a rapidly growing sarcoma. Take into consideration the characteristic features of each form of swelling. The exploring syringe may be used, but may be dangerous—e. g., puncturing the bowel in mistaking a strangulated hernia for an inguinal abscess. Never plunge a knife into an abscess. Cut down to the tumor, or burrow, when through the skin, with a pair of artery clips.

Describe the treatment of abscess?

Pus, being a foreign substance and a potent poison, should be removed as soon as discovered. First, thoroughly cleanse, disinfect and shave the part to be operated. Open at the most dependent portion, the object being, first, to evacuate the pus, and, secondly, to keep the abscess cavity empty; i. e., to establish drainage. The nearer the opening to the dependent portion, the more thorough will the drainage be. An incision an inch long is generally large enough in a moderate-sized abscess. Rather than make a free incision, make two or three small ones. Now explore for the most dependent portion and make a counter opening. Next evacuate the cavity and disinfect the same by irrigating thoroughly with some antiseptic fluid (bichloride solution 1-10,000 carbolic acid solution 1-40, etc.). These solutions are dangerous in children and should be followed by less potent solutions (potassium permanganate or crealin solutions), or not used at all. In infants it is advisable never to use them. Drainage is now carried out by strips of antiseptic gauze, or tubular drains of rubber, or glass, or bone. In large abscesses, through and through drainage may be made by gauze or tubing passing in one opening and out another. Finally dress the wound with antiseptic applications, which may be occlusive or wet dressings. Generally the abscess needs a number of evacuations and cleansings, in which case the same procedure is gone through as is described above. After the local treatment, the general symptoms usually disappear. When they remain, suspect blood poisoning. Healing takes place by granulation.

What is a sub-acute abscess?

It is an acute abscess with the acute symptoms removed. It is slower in formations.

What is a chronic or a cold abscess?

It is an abscess resulting from infection with the pyogenic microorganisms of some previous pathological change. This is typically exemplified in a tubercular process.

How does a cold abscess differ from other abscesses?

In that it does not contain pus. Those resulting from tubercular changes, particularly, contain simply the product of tubercular inflammation and not pus. They also develop very often at a point remote from the seat of the primary disease—e. g., a lumbar abscess is usually the result of a tuberculosis of the vertebrae. These cold abscesses con-

tain a flocculent or a cheesy material. The symptoms manifest in a cold abscess are not at all like those of an acute abscess. All symptoms of inflammation are wanting in the early stages. The tumor may take weeks, months or even years to develop. Then pain may result as a symptom of a chronic abscess caused by pressure on some nerve filament.

General symptoms may be exaggerated, because of the primary local changes in original seat of the lesion. There is usually a low form of fever. The general symptoms increase as the coagulation in the abscess cavity becomes greater.

What is the treatment for a cold abscess?

After making all antiseptic precautions possible, incise freely and thoroughly cleanse the cavity by curettage and subsequently with an anti-septic solution, preferably chloride of zinc (10 per cent.). After cleansing, partially close cavity and drain; or, close entirely, having filled the cavity with some disinfecting solution, such as a 10 to 30 per cent. solution of iodoform and glycerine, or of iodoform and ether. This latter is better in small cavities, as the ether evaporates rapidly and leaves the walls of the cavity coated with iodoform. Try to remove the primary cause of the disease if possible. Treat also the system in general. In cold abscess, treat the specific condition; i. e., the tubercular condition, and, aside from this treatment, place the patient on a stimulating diet and give a tonic treatment throughout.

PHLEGMONOUS INFLAMMATION AND SUPPURATION.

Describe phlegmonous inflammation and suppuration.

A phlegmonous inflammation is one that has a tendency to spread rapidly and is of such a degree of acuity as to rapidly cause destruction of the involved tissue. It is usually dependent upon the infection of the streptococcus, though the staphylococcus sometimes is also present, complicating the infection as will be seen later. The streptococcus has a greater tendency to spread than the staphylococcus. It is taken up particularly by the lymphatics and in this way rapid destruction follows.

A phlegmonous inflammation usually begins from some slight superficial abrasion, and rapidly spreads to other tissues. There are symptoms of acute inflammation with a definition of the lymphatic vessels along the surface (seen as red lines), and a rapid swelling of the parts, which soon become infiltrated. When the staphylococcus is present, the connective tissue also undergoes suppurative changes. This pus burrows in the superficial fascia, unlermines the muscular fascia, separating the muscles and vessels down to the bone. This condition being but a slight degree less than a purulent infiltration. If purulent infiltration occurs (purulent oedema of pus), the inflammation is so great that the tissues have not time to be changed into pus. Then coagulum or necrosis takes place rapidly and the connective tissue simply dies en masse and gangrene is the result.

How can diagnosis be made?

Phlegmonous inflammation and suppuration cannot be mistaken for anything else. There is a rapidly spreading inflammation usually following some extreme injury; e. g., a compound fracture of the leg. This has a tendency toward a rapid destruction of all parts involved.

Describe the subjection and local indications present in phlegmonous inflammation and suppuration.

The subjective symptoms are usually found to an extreme degree. The local indications are usually ushered in by a chill and a rapid rise of temperature, viz., a septicaemia, which, unless rapidly subdued, will cause the patient to succumb quickly.

Describe the treatment of phlegmonous inflammation and suppuration.

It is an imperative duty to incise at once. The sooner, the better, Make good, free incisions, exposing the parts as thoroughly as possible. The sooner the pressure is overcome, the sooner relief occurs and a better chance has the circulation of becoming re-established. After incising, if any sloughs are found, they should be carefully excised and the parts thoroughiy disinfected. When the condition is less acute, multiple incisions will be found sufficient, probing along the track of the pus.

If local changes and general symptoms persist in spite of our endeavors to overcome them, amputation of the part may have to be resorted to. This should be made through the healthy tissue.

The general treatment must be a tonic one. Antipyretics are useless.

FELON.

What are the varieties of felon?

There are three varieties, viz.: A superficial form, involving the skin and subcutaneous tissue; another form, developing in the tendon sheath, practically a suppurative thecitis, and, finally, another form, beginning as an osteo-myelitis, or the bone felon.

Describe the three varieties of felon.

The two former varieties are almost invariably due to infection from without, and become manifested by symptoms of acute inflammation and are accompanied by much pain. The first variety is practically a boil, involving but the skin and subcutaneous tissue, and is of but slight significance as to consequence. The second variety, when due to a thecitis or a teno-synovitis, becomes serious, as it is apt to burrow along the course of the tendon to the superficial fascia. The deep fascia may become involved from this, giving the "shirt-stud" abscess, and finally it extends to the bones.

With the exception of the little finger and the thumb, the felons with these suppurative inflammations of tendons tend to stop at the metacarpal phalangeal joints. Occurring in the thumb and little finger, these felons, especially the second variety, require speedy treatment.

The third variety is characterized by extreme pain and absence of early local manifestations of inflammation. The distal phalanx is tender to the touch, particularly on the palmar surface. The first local change is swelling, caused by oedema, which, if allowed to go on, will break through the periosteum and the phalanx become probed.

Describe the treatment for felons.

The first indication is prophylactic treatment, disinfecting carefully any abrasions on the fingers. Treat pain by the application of cold, but incision made early will relieve the tension and the pain. Therefore, incise early. Incise only till pus is found, as going deeper to the bone may make a deep felon out of a superficial one. Treat now as any abscess. It may not be possible to pack, as the wound may gap.

What anaesthetics should be used in operating on felon.

In local conditions, cocaine or the chloride of ethyl may be used. The latter is preferable, as the cocaine injection increases the tension,

and so the pain. When the palm is involved, a general anaesthetic is called for.

PALMAR ABSCESS.

Describe the treatment of palmar abscess.

It should be opened and all the parts thoroughly cleansed, tracing the cavities to their farthest portions. In deep palmar abscess it may be advisable to make counter-openings on the dorsal side, thus establishing drainage from the palmar to the dorsal side. As the general symptoms are very extreme (as a rule saprophitic in their nature and bordering on those of septic infection) the patient should be placed in bed and a splint applied to the part.

ULCERATION.

What is meant by ulceration?

By ulceration we understand a solution of continuity of the soft structure, particularly where there is no tendency to heal; where the granulation tissue develops up to a certain point and then becomes destroyed.

Ulcers are usually the results of inflammation, there being a destruction of tissue without a tendency toward complete healing.

How are ulcers classified?

As simple and specific. Simple ulcers are those due to a local change, while specific ulcers are those dependent on some constitutional condition, such as syphilis and tuberculosis particularly.

They are also classified as to their immediate cause and finally as to their symtomatic manifestations. These are:—Irritable ulcer (very painful). Callous ulcer (a hard ulcer). Inflammatory ulcer, one accompanied by manifestations of acute inflamnatory changes in its immediate vicinity. Varicose ulcer; this is the most common and is an ulcer dependent upon a pathological condition of the leg.

Describe varicose ulcers.

These result from varicose veins and are particularly found in the extremities. These veins become dilated, their walls are permeable, and as a result there is a transudation of blood into the tissues. These tissues become oedematous, and the red and white blood cells, that have also passed through the vessel walls, undergo oxidation and pigmentation results. These conditions are found chiefly in women who have borne a number of children. Any injury to these parts may result in a varicose ulcer.

Describe irritable, infiltrated, indolent, haemorrhagic, fungus, specific, malignant and phagedenic ulcers.

An irritable ulcer is one accompanied by considerable pain and usually situated in the lower extremity, lower down than the varicose ulcer. This ulcer has a tendency to heal and then suddenly changes, and ulceration occurs in defiance of the healing tendency.

An infiltrated ulcer is a simple one. It may be a varicose or a specific ulcer that is complicated by an acute inflammation.

An indolent ulcer is one that shows absolutely no tendency to heal.

Haemorrhagic ulcers are those that have a tendency to bleed, which tendency is largely due to their location and the development of granulations, which, as the ulceration proceeds, open and the vessels bleed. They should be looked upon with suspicion, as there is a proliferation of tissue cells into the deeper structures.

A fungus ulcer is one in which there is an excessive granulation tissue development which becomes oedematous, giving the appearance of a fungus. It is very active in character and difficult to handle.

Specific ulcers are almost invariably of a syphilitic or tubercular character. In specific ulcer, the edges are invariably undermined, the ulceration proceeding under the edge of the denuded surface. There is also marked infiltration in the vicinity of the ulcer, owing to the chronic changes taking place. This infiltration is accompanied by increased blood supply and more or less of pigmentation; and preceding the infiltration, when not of such long duration, the ulcer has a peculiar purple or dark red color (copper-color). It is apt to be rounded or oval, in contradistinction to the tubercular ulcer, which is decidedly irregular in outline and is called serpiginous. The tubercular ulcer also has greater tendency toward the development of granulation tissue, like the fungus ulcer. In the specific ulcers we find, usually, other manifestations of the disease.

Malignant ulcers are those accompanying malignant tumors, particularly carcinoma; e. g., a carcinoma develops till a certain retrogressive change takes place, breaking down occurs and an ulcer results. Oftenest seen in carcinoma of the breast. Malignant ulcers have a particular tendency toward haemorrhage, from the vessels being embryonic in character.

A phagedenic ulcer is one sometimes specific in its nature and characterized by a tendency to rapidly spread and involve the surface. Phagedenic chancroid is a good example.

What is the treatment for ulcers?

First, prophylaxis. Treat any predisposing condition; e. g., varicose veins should be protected from injury, supported and be treated by the internal remedy (carefully applied bandages or elastic stockings, remedies acting on the vessel walls). Next disinfect thoroughly by the use of well-known antiseptic dressings, e. g., peroxide of hydrogen (followed by some weak solution, preferably carbolic acid 1-250 or 200). Apply antiseptic compress. Next. when ulcerated surface is antiseptic, stimulate granulations by iodoform, or iodoform and boric acid, or aristol. When wound is undermined, subnitrate of bismuth, either alone or with Peruvian balsam, one part, and olive oil, ten parts, may be used. Active stimulants are sometimes advisable, such as silver nitrate 1, 2, 3, or higher per cent. solutions, applied three or four days before other dressings. Cauterization is also profitable with stick nitrate of silver or nitric acid. Curettage is better than these caustics. Anaesthetize patient and curette thoroughly. This is particularly indicated in callous ulcers. Incise and excise the callous edges, powder with iodoform, cover with iodoform gauze for ten days. Use only in an aseptic ulcer. Iodoform is not antiseptic until moist and the iodine is set free.

Skin-grafting is also used in treatment of ulcers where the ulcerated surface is large. Reverdin's or Thiersch's methods (see index). Skin-grafting is only of use when the ulceration surface is aseptic; otherwise it is useless.

Ulcer may be excised, particularly when suspected to be malignant. Excise freely and slide a flap of skin over raw surface where possible. This is indicated for small ulcers of face or neck.

Physiological rest is all-important. Ulcers often heal from rest alone.

Remedies:—Silicia, carbo veg., etc. When dependent on some constitutional change, arsenic, iodide of arsenic and iodine.

Pay special attention to general condition, particularly in specific ulcers; give the internal remedy. This alone often cures. For syphilitic ulcers use iodide of potash (appreciable doses) and bichloride

of mercury. Locally for tubercular ulcers use excision, especially glandular ulcers. Lactic acid also may be used locally in a 10 per cent. solution.

FISTULA.

What is a fistula?

It is a sinuous canal leading from the surface to a normal cavity or organ. Examples:—Rectal fistula, anal fistula, bronchial fistula (from bronchial tube or trachea to surface). Fistulae are usually the result of localized, suppurative inflammation and pathologically they are tubular ulcers. A tubular ulcer is a fistula when it communicates with either a pre-existing cavity or organ, while a sinus is a tubular ulceration not leading to an organ, but to some deeper structures, such as bone.

Mention some of the common varieties of fistulae.

Anal fistula, an opening in the anus. Intestinal fistula, leading from the surface into the intestine. Gastric fistula, leading from the surface into the stomach. Recto-vaginal fistula, leading from the rectum into the vagina.

From what do anal and recto-vaginal fistulae result?

Anal fistula is usually caused by a suppurating haemorrhoid; a recto-vaginal fistula by an area of necrosis, brought about by pressure, perhaps long-continued pressure, as during labor.

SINUS.

How do sinuses develop and to what are they due?

They develop in a similar manner to fistulae. Often they are caused by some foreign body in the tissue; e. g., an osteo-myelitis, going on to bone necrosis forms a spontaneous opening in endeavoring to rid itself of the dead bone. Again, silver wire, ligatures, steel and ivory pegs may be causes.

Describe the treatment for sinuses.

Remove the cause. If a ligature, its removal will often be followed by a rapid closure of the sinus. Healing is utterly impossible unless the irritating cause be removed. Even if the wound be rendered aseptic and heal over for a time, it will reopen and continue.

What is the treatment for fistulae?

There are two methods. One is to thoroughly cleanse canal by curettage (the treatment for ulcer), rendering the condition aseptic, and then favor healing by drainage, seeking to obtain granulation development from the bottom. This is a slow and unsatisfactory method. The other method is a radical procedure: Convert the fistula into an open wound by dividing the intervening structures.

In shallow fistula, as between the rectum and vagina, where there is mucous membrane on both surfaces, with intervening tissue, plastic operations are made. The edges of the opening are vivified and flaps transplanted. Internal medication is practically useless. In tubercular fistula, do a radical operation; the patients improve after it, as one of the drains on the system is stopped.

Internal treatment is of paramount importance in specific fistulae.

CHILL AND FEVER.

What is fever?

It is a general disorder of the system, characterized by an abnormally high temperature of the body and commonly accompanied by shivering and chill at the beginning of the attack, followed by quickened pulse and respiration, burning heat, thirst, loss of appetite, etc.

What is chill?

It is a sensation of coldness which precedes a fever, often with shivering or shaking. It varies in its degree from a positive chill to simply a chilly sensation. The vaso-motor contractors exert their influence in contracting the superficial blood vessels and as a result a decreased amount of heat is eliminated; the surface of the body becomes cool, which affects the sensory nerves, resulting in the feeling of chilliness. The temperature rises during a chill. The skin is dry, the extremities cold and the face cyanotic. As the chill subsides, the bodily surface becomes hot to the touch, and finally a perspiration results.

What is the cause of fever?

The animal organism contains a certain amount of heat, equal in all persons, no matter in what climate they live. The greatest source of heat rises from muscular action. Organs and glands in functionating also produce heat, as do the brain and other structures also. This heat is eliminated particularly by the lungs and skin surface. Oxygen is consumed during the production of heat and carbonic acid is given off. In health heat production and dissipation are equalized. The heat is carried to the surface from the central portion of the body by the blood vessels. The normal temperature is 98.4 degrees, Fahrenheit. In case of burn, the temperature falls below normal because of the rapid elimination of heat brought to the surface by an unusual amount of blood. The heat which produces the burn disappears, and the vessels dilate, allowing more blood in the part. Heat is eliminated, and the entire circulation of blood is cooled. Aside from the production and elimination of heat by the various tissues, it is now believed that a certain set of nerves governs heat production. This set is composed of two varieties, a certain set increasing the temperature and another set inhibiting it (excitor caloric and inhibitory caloric). This heat regulation is known as thermotaxis.

Fever is a condition accompanied by a pyrexia and symptoms of general malaise, lassitude, anorexia, decrease in quantity of urine excreted, highly-concentrated and highly-colored urine, headache, increased frequency of respirations due to pyrexia alone, increased rapidity of pulse.

The high color of the urine and its concentration are due to the disintegration of blood cells and the products of blood disintegration.

What are the three stages of fever?

Stage of invasion, the uncoming of the fever. The stage of crisis, where the fever has reached its acme. The stage of defervescence or stage of decline.

Mention the various kinds of fever.

Continuous fever, the temperature having risen to a point above normal and remaining there. Intermittent fever, the temperature varying at different times one, two or three degrees. Remittent fever, the temperature rising to a certain point, and later dropping to normal, and then rising again.

What is the cause of fever?

It is due to the introduction into the circulation or the body of some

pyrogenous substance. Inert substances, water, ligatures, etc., may give rise to an increase in temperature. Surgically, it is due to the absorption either of bacterial products, ptomaines or leucomaines.

Mention the surgical fevers.

Aseptic fever or fermentative. Septic intoxication (sapraemia). Septic infection (septicaemia). Pyaemia.

These four fevers, beginning with a fermentative fever, bear a direct relationship to each other, the line of demarcation being at times sharply defined and at others very difficult to comprehend.

Describe fermentative fever.

It is caused by the introduction of various substances, especially fibrin ferment. Following an operation, there is bleeding and the introduction of foreign substances, especially ligatures. The blood coagulates, fibrin ferment is set free and the irritation by these foreign substances or tightly-tied stitches produces a coagulation necrosis. This sets free albuminoid substances, and they all give rise to a rise of temperature. The degree of pyrexia after an operation is therefore in direct proportion to the amount of blood extravasated, the amount of foreign material introduced and the degree of tension produced by the stitches. A fall of temperature after an operation is due to a decrease in the amount of heat produced and an increase in amount dissipated. The more the exposure of the patient, the greater the loss of heat. The rise in temperature depends on the amount of fibrin ferment liberated, and this upon the amount of blood extravasation or oozing. The temperature in a fermentative fever should reach normal on the third day.

Describe sapraemia or septic intoxication.

It is always due to the absorption of ptomaines, or putrefactive substances from the outside, e. g. a retained portion of the placenta. Following a fermentative fever comes the fall in temperature; then, if any putrefactive material be left in the wound a marked chill takes place, immediately followed by a rise in temperature, caused by the putrefactive bacteria, saprophytic in character, having set up putrefaction in material which is afterward absorbed by the system which it poisons. This fever is continuous until this foreign putrefactive material is removed, when it falls to normal after a short space of time.

What is septic infection or septicaemia?

It is the third stage of surgical fever, and is an actual blood poisoning, resulting from the multiplication of the bacteria in the system in contradistinction to the mere introduction into the system of the bacteria themselves and the putrefactive material as occurs in septic intoxication. In septic intoxication then the bacteria do not multiply.

The variety of bacterium causing septic infection is in most instances one form or other of the streptococcus. It gains access into the system, develops ptomaines and a septicaemia or blood poisoning results.

Give briefly a clinical picture of septicaemia.

A prick of the finger. No attention paid to it. Site of wound disappears, but lymphangitis develops, shown by red lines running up the forearm and some induration of the glands, and possibly pain. Third or fourth day, inflammation. Suddenly marked chill followed by a rise in temperature with lassitude, apathy and headache. Accompanying or following chill, vomiting, apathy, headache, no appetite, diarrhoea. Conditions aggravated at night. After three or four days, eruptions on surface of body erythematous, haemorrhagic or ecchymotic, then under the mucous membrane. Urine decreased, higher specific gravity, excess of urea. Delirium,

dependent on oedema of the brain present toward the end; pulse here soft, compressible, rapid in proportion to degree of pyrexia. After a week or ten days, death.

Post Mortem:—Ecchymotic changes of serous membranes; capillary haemorrhages; parenchymatous organs congested; kidneys and spleen cyanotic; spleen soft and pulpy; brain hyperaemic; if disease has lasted long enough there is lung consolidation from hypostasis.

Microscopically, tissues in process of cloudy swelling or parenchymatous degeneration, extending even to muscular structures. Blood and lymph cultures and those from tissue juice show one or another form of streptococcus and occasionally some form of staphylococcus.

Give the treatment for surgical fevers.

In fermentative variety, drain wound. In septic intoxication, use prophylaxis, remove the cause, disinfect part. In septic infection, remove the primary cause, blood clot, pus, retaintained placenta, etc., and endeavor to destroy the infection. Give quinine, as it is both a bacteriacide and a stimulant. The other remedy is alcohol. Treat other symptoms by indicated remedy. Weak heart calls for strychnine, digitalis, atropine, nitro-glycerine. Other homeopathic remedies: Lachesis, crotalus, muriatic acid, mercury (bichloride), arsenic. Aconite, belladonna and gelsemium in the beginning of septicaemia. Quinine in beginning, not good in small doses, ten grains may be given and then the remedy stopped. Alcohol: Whisky or brandy; late stages, champagne until the physical signs of intoxication are produced. Give nutritious diet, predigested foods and albuminized foods. Milk with eggs. Whiskey in form of egg nog. Keep patient isolated and at absolute rest. It may be necessary to stop or cause a diarrhoea.

What is surgical scarlet fever?

It is a fever frequently occurring in children after operations about the genitalia or a stone in the bladder operation. No desquamation takes place. It is simply an erythema caused by vaso-motor changes. Operations seem to predispose children to scarlet fever. This form passes away in twenty-four or forty-eight hours.

Describe pyaemia.

Pyaemia is the extreme degree of surgical fever and is characterized by recurrent chills and the development of metastatic abscesses. The temperature is of a remittent character. It frequently follows infection and is due to the entrance into the circulation of pus or some of its component parts.

It is also associated with suppurative necrosis, contrary to septicaemia, and there is invariably a suppurative process.

Describe the two varieties of pyaemia.

Simple pyaemia or suppurative fever is characterized by a more or less continuous fever, such as accompanies prolonged suppurative conditions or inflammation and where there are marked tissue changes, characterized by amyloid degeneration of the various organs, muscles, glands, liver and kidneys, etc. The temperature is continuous and there is no tendency to reach a high degree. It may run between 100 and 102 degrees, dependent probably more on the absorption of chemical poisons, as a result of suppurative changes that have taken place, than an absorbed bacteria; simple pyaemia is the first stage of pyaemia.

Upon what pathological change do all subsequent changes in pyaemia depend?

A phlebitis (an inflammation of a vein).

This occurs in the immediate vicinity of the wound and as a result of it there is developed a so-called white thrombus. It develops as follows: The endothelial lining of the vein becomes plugged, causing an accumulation of bacteria, particularly the pyogenic micro-organisms. These adhere, offer an increased resistance to return circulation and cause a coagulation of the white or third blood cell, resulting in a thrombus or coagulum.

This thrombus has no tendency to go on to organization. It becomes fragmented, small pieces are swept off into the circulation and these may lodge in any part of the vessel walls where there is a diminution, not infrequently upon the valves of the heart. Carried along in the circulation to a vessel too small to permit passage and as a result an infarct is developed. Emboli may become arrested in the so-called end-arteries and usually these are in the internal organs and here we find the metastatic abscesses.

These emboli exert their pathogenic influence and a suppurative inflammation results which progresses to an abscess formation and symptoms are ushered in by a chill followed by a rise in temperature.

The surface of the body is also involved and especially the joints, knee, sterno-clavicular and shoulder joints particularly.

Any recovery is but for a short time, the internal organs being damaged by cicatricial tissue.

Mention some of the other changes occurring in pyaemia.

The blood loses its power of coagulability, the cells become crenated and the white cells are increased. Urine not at all characteristic. Urea increased, sometimes albumin present, occasionally fibrinous casts, and at times pus cells.

What often accompanies pyaemia in children?

An osteo-myelitis that goes on to suppuration. Frequently in cases of multiple osteo-myelitis in growing individuals, there is a development of pyaemia that leads to a rapidly fatal termination.

What is the treatment for pyaemia?

Attend to the wound first. Disinfect even to sacrificing the limb if it will be of any avail. Open all abscesses as soon as they develop. Treat general condition by giving a highly nutritious and stimulating diet, and administer alcohol. Use remedies as indicated. In chronic pyaemia remedies have a marked influence. Ferrum phosphoricum, and the remedies mentioned in septicaemia.

Surroundings are important. Give fresh air. Change should be made as often as possible. Patients are apathetic, indifferent, irritable, restless and fretful as the disease advances, followed by coma and death. The pulse in the beginning is full, strong and rapid. Its volume is greatly decreased until failure is indicated.

SPECIFIC INFECTIOUS DISEASES.

ERYSIPELAS.

What is erysipelas?

It is a specific infectious disease characterized by an inflammation of the skin, particularly the lymphatics of the skin and mucous membrane. The point of infection is invariably on either the skin or mucous membrane. It exhibits at times a tendency to develop epidemically.

It is caused by a form of streptococcus; the streptococcus of Fehleisen. This bacterium has not such a great peptonizing influence upon the structures as the streptococcus pogenes, with which it was first

believed to be identical; and is much larger than the ordinary pus producing streptococci. It is not believed to be pyogenic in its character and so pus is not a factor in erysipelas, which is due to a mucous invection.

The tendency toward self-limitation which erysipelas seems to have is largely due to the lymphatics becoming plugged up by bacteria, which give rise to ptomaines, which destroy the bacteria themselves, giving the characteristic appearance to the skin known as erysipelatous.

Describe the lesion caused by erysipelas.

There is a sharply defined limitation between the uninflamed and the inflamed area, explained by the plugging up of the lymph vessels. This line of limitation is irregular and fan-shaped, the tissues being distinctly elevated above the level of the non-infected skin.

Erysipelas spreads rapidly, involving at times the greater portion of the body surface, though usually limited from the plugging of the lymphatics. Its period of inflammation is from two to three days, depending on the virulence and the quantity of poison inoculated.

Give the symptoms of an attack of erysipelas.

It is usually ushered in by a sharp chill followed by a rise in temperature (104 to 105) with a full pulse of a hundred or above. Delirium is often the first symptom. Accompanying these are anorexia. headache, vomiting and diarrhoea at times, constipation. Area of infection becomes a bright red, shading into purple. This exists for a varying time from twenty-four to seventy-two hours, when the redness gradually fades, the fever symptoms subside and the patient is well.

When more virulent, there are localized areas of necrosis of the superficial portions of the skin, giving rise to bullae or blisters. The serum contained in these bullae is very infectious, containing the specific streptococcus. The bullae vary in size and number. The variety characterized by the bullae is called erysipelas bullosum; that where the vesicles predominate vesicular erysipelas.

Mention and describe the varieties of erysipelas.

Migrating erysipelas, or erysipelas migrans, is that form of the disease developing on one part of the body, disappearing and coming out at some other portion.

Erysipelas metastaticum is an erysipalatous inflammation occurring in an organ or part separately from the primary field of infection, e g., erysipelas of the scalp is often accompanied by a violent inflammation of the meninges.

Phlegmonous erysipelas is a complication of erysipelas per se, the staphylococcus usually being responsible for this. From appearing as a septic intoxication it may fade into a condition of septic infection or even pyaemia. In the more virulent cases it simulates a purulent infiltration which may rapidly develop into gangrene, and then results a gangrenous erysipelas.

Lymphangitis may also occur between the wound and the seat of the disease. This is shown by the red lines.

Erysipelas on the face and head is the most dangerous, as it is liable to affect the brain; high fever, marked mental symptoms, etc. Erysipelas of the mucous membranes is characterized by the same changes as those in the skin. It may occur in the mouth, nose, pharynx or larynx; and it may spread and cause what is called an erysipelatous pneumonia. The internal organs may also become inflamed and gastritis or enteritis result with a consequent diarrhoea, sometimes bloody stools. Possibly intestinal ulceration or perforation and peritonitis.

What is the prognosis of erysipelas?

It varies, but is favorable in the majority of cases, being modified

particularly by the complications arising during the course of the disease.

Give the treatment of erysipelas.

Simple erysipelas may run its own course in a few days, and require no attention. Avert complications. Asepticize wound if any.

If any serum or pus under cicatrix, reopen and disinfect. Physiological rest and protection from any external influences are required. Use sterilized oil, carbolized vaseline or borated vaseline.

It is often advisable to apply cold antiseptic compresses, iced water, ice directly. Disinfectant solution may be injected into the surrounding healthy skin, e. g., carbolic acid (2-3 per cent.); weak solution of bichloride of mercury, sulphate of zinc, silver nitrate, cocaine, etc. Inject at numerous points, and surround the entire area involved. Scarification of the surrounding healthy area. Map out involved area with tincture of iodine. Pressure by means of collodion (collodion contracts) or adhesive plaster. Internal remedies: Bell., rhus, apis, quinine.

In phlegmonous erysipelas freely incise to relieve pressure and to obtain thorough disinfection; follow by antiseptic dressings (acetate of aluminium.)

What influence has erysipelas on wounds and new growths?

It often causes complete healing when it attacks old wounds, ulcers, etc. It also prevents further development of tumors by its inoculation, the virus attacking the tumor cells and causing a rapid fatty metamorphosis. This is followed by an absorption and a disappearance of the disease.

Inoculation should be done advisedly, keeping in mind that erysipelas itself may prove fatal, particularly if complications occur.

What is erysipeloid?

It is a condition resembling erysipelas.

It is characterized by an erythema accompanied by a dense infiltration of the skin. It is found on the hands and is observed in those individuals dealing with dead organic, matter, dead animals, fish and oysters. Inoculation occurs usually through some slight abrasion. It develops slowly, progresses for four to eight weeks unless treated and gradually disappears. It is annoying not so much from the pain as from the itching in the form of a peculiar pricking sensation rendering patient unable to work.

Treatment results satisfactorily. Injections of carbolized solutions into the tissues and the inunction of antiseptic unguents, as carbolized vaseline, are employed. Blue ointment has been proven efficacious. Infiltration is reduced by the iodide of potash internally, and the same as an ointment externally.

TETANUS.

What is tetanus?

It is a wound complication and is described as a specific infectious disease, characterized by the development of both clonic and tonic spasms. It may be general, involving the entire system, or local. The local form is known as trismus, which is usually found in the neck and face and is known as lock-jaw. As all infectious diseases it has a period of incubation of from three days to a week or longer. It most frequently complicates insignificant wounds, especially those caused by splinters of wood, nails, etc.; therefore it is most frequently found in gardeners, florists, stablemen, carpenters, etc.

What is the cause of tetanus?

It is caused by the bacillus tetani, an anaerobic micro-organism of bristly appearance with a peculiar club-shaped extremity containing a spore. Being anaerobic, they are found in the superficial layers of the soil, in decaying timber, such as is found in the floors of stables. Their ptomaines produce tetanus.

Give the pathology of tetanus.

There is an active cellular proliferation in the cord and peculiar crescentic haemorrhages, blood extravasations. An inflammation in the neuroglia of the larger nerves. Clinically tetanus is characterized by a high temperature, its insidious development, with a marked tendency to grow worse. Secondarily there is a parenchymatous degeneration of various organs, a cloudy swelling.

Mention and describe the varieties of tetanus.

The varieties are acute, sub-acute and chronic.

The more acute the tetanus, the more acute the period of incubation, the more violent its symptom and the more rapidly fatal its course. Acute tetanus is almost invariably fatal. In sub-acute tetanus, the patient usually recovers and in chronic tetanus the prognosis is better.

Give the clinical symptoms of an attack of tetanus.

First, general lassitude, then, a certain stiffness in a particular group of muscles, usually those in the immediate vicinity of the wound Stiffness develops into clonic spasms, which spread from one group to another, possibly involving the entire body. An irregular and high temperature (103-106). Glycosuria is another characteristic. Patient complains of a stiffness in the back of the neck and a headache. The mind is unimpaired unless dissolution is coming on. The pulse is strong at first, but gradually becomes weaker and more rapid as disease progresses. There is also anorexia and constipation. In the chronic and sub-acute forms, the disease is limited to a group of muscles. Oftenest those of mastication, when it is called trismus, which is more amenable to treatment than the acute form.

What is the treatment of tetanus?

Direct attention to wound first and thoroughly disinfect with nitrate of silver, which is the best disinfectant as its action on the bacillus tetani is very active. After tetanus has developed, wound may be reopened and cleansed. Amputation has been suggested, also incision of a portion of the nerve affected and nerve stretching. Good results have followed all these methods.

Treat the general condition of the patient. The slightest irritation causes spasm, so the patient should be isolated in a dark room without windows and his ears plugged. Absolute quiet is essential above all else. Control spasms by an anaesthetic or anodynes, preferably chloral hydrate (20-30 grains); bromide of potassium (10-20 grains.) Give these drugs per rectum, preferably. Morphia hypodermatically, strychnine for flagging heart. Gelsemium, 3 to 5-drop doses of the tincture every three or four hours in sub-acute and chronic varieties. Passiflora, one drachm every hour for restlessness and irritability. Anti-toxin is of little value.

GLANDERS.

What is glanders?

It is a disease about which but little is known pathologically; it simulates infectious granulomata and is found particularly in horses and some of the domestic animals. Here it is characterized by the de-

velopment of nodules, particularly about the nasal mucous membrane. At times it develops in the lungs and deeper structures where it runs a rapidly fatal course.

It is found among individuals who are associated with horses, developing about the nasal mucous membrane and mouth and spreading along it to the posterior nares; or, over the surface of the face in the form of nodules that have a tendency to break down. It may occur by inoculation of a finger. There is rarely much fever save in the later stages when it is sapraemic in nature. Little can be done after the disease has developed.

What is the cause of glanders?

A specific micro-organism known as the bacillus of glanders which resembles very strongly the tubercle bacillus, though not as long, but broader. It cannot be stained by any of the aniline dyes and is therefore readily and easily demonstrable.

What is the treatment for glanders?

Excise nodules as soon as developed or thoroughly cauterize with the actual cautery or some escharotic, as nitric acid or zinc chloride. Internally, give remedies indicated.

ANTHRAX.

What is anthrax or splenic fever?

It is a specific infectious disease caused by a specific bacterium known as the bacillus anthracis. It should not be confounded with carbuncle which is a localized suppurative inflammation due to a streptococcus pyogenis. The anthrax bacillus is probably the largest micro-organism known and it is morphologically characteristic.

Anthrax is a disease common to cattle and is frequently carried from them to man. It is rag-sorters' disease or splenic fever. It is characterized by a local change that goes on rapidly to a condition of gangrene. It is found particularly in those individuals associated with cattle or their products, hides, hair, etc. It is either inoculated or finds access into the system through a wound, abrasion, the respiratory tract or the digestive tract.

Describe the local changes seen in anthrax.

There is a rapidly developing localized inflammation which rarely results in pus. There is tissue destruction en masse, viz., gangrene. This gangrene is produced by the mechanical effect of the micro-organisms that multiply rapidly and become disseminated throughout the system, thus a local disease resulting in a general infection that is rapidly fatal. Nearly all organs are found to contain these bacteria and especially the spleen which assumes enormous proportions at times and is accompanied by a fever. When taken in through the respiratory tract, a pneumonia develops as a rule and the changes occurring here are similar to those of the localized external infection.

It has cropped out as an epidemic with dire results.

The bacillus anthracis is very resistant to external influences and its spores are still more so; they may resist various influences for months.

Give the treatment for anthrax

Prophylaxis, thorough antisepsis. Only such incisions are indicated as will permit of disinfection of deeper structures by means of a hot iron or some of the stronger caustics.

HYDROPHOBIA.

What is hydrophobia?

Hydrophobia, lyssa or rabies is a disease common to the dog and its variety of species, wolf, hyena; and to some extent cats and rats. It is believed to be of an infectious character and nature, though no specific poison has been demonstrated. Its period of incubation is prolonged (anywhere from four weeks to twelve months).

The changes occurring are not well understood. There is a severe myelitis and an atrophy of the ganglionic cells of the cord. This myelitis is characterized by a parenchymatous inflammation.

Clinically two forms of rabies are recognized, the maniacal form and the still variety.

The disease is invariably carried to man through the bite of one of the animals above mentioned; ninety per cent. resulting from dog bites, four per cent. from wolves; four per cent. from cats and two per cent. or less from other animals.

Describe the course of the disease in the dog and in man.

In the Dog:—Prolonged incubation, then the first, the dangerous signs. Dog melancholy, wants to eat indigestible substances, pieces of wood or hair, lies around, becomes lazy and exceedingly irritable, refuses to eat, also refuse liquids (liquids do not produce the symptoms of hydrophobia, but the endeavor of deglutition produces the spasm of the muscles of deglutition). Irritable disposition changes into one of insanity (seemingly); he runs around, tries to get out of an open door or window and bites at everyone. Active exercise of jaw produces salivation "frothing at the mouth." The dogs are particularly dangerous at this stage of the disease, owing to their snappy quality. Convulsions follow and spasms appear generally (tonic or clonic). Each spasm is followed by a stage of prostration which increases at every convulsion until dog dies. Duration of this form is from three to four days.

In the still rabies, the maniacal manifestation is absent. Dog is morose, melancholy, very irritable and finally becomes paralyzed. Usually he has a spasm followed by paralysis of the hind quarters. Spasms followed each time by more marked prostration and finally the animal dies.

In Man:—Long after wound has healed, which it does very rapidly, the scar becomes swollen; shortness of breath from spasm of thorax, particularly the diaphragm; paralysis ascends to pharynx, causing dysphagia.

The mind remains clear to the last, which is the only exception to the course the disease runs in the dog. These convulsions repeat themselves frequently and are followed by marked prostration, the patient succumbing on the third, fourth or fifth day. The history of the case will aid materially in differentiating this disease from tetanus. Tetanus is accompanied by a hyperpyrexia and hydrophobia has almost no fever.

What treatment can be given for this disease?

Hydrophobia can only be moderated by medicine as the disease is invariably fatal. The anti-spasmodics may be used. Chloroform. Curare mitigates the spasm by paralyzing the voluntary muscles. Pasteur's prophylactic treatment has proven highly efficient in the prevention of the disease. On the theory that the severity of the disease depended on the amount of poison that was introduced he made an antitoxin from the desicated spinal cord of a dog, which had died of rabies, by mixing it with bouillon of veal; and injected it subcutaneously. The poison loses its virulence as it becomes dry and this serum has different strengths depending on the amount the cord contains and the age of the animal. He first injects a weak serum, one from a cord that has

dried for twelve or fourteen days, then later a stronger, etc., till the patient becomes acclimated to the poison. This is the only method that has been followed by any success.

Immediately after the bite, disinfection is the treatment called for. The hot iron, carbolic acid and nitric acid may be used as escharotics. First, then, disinfection, then sucking of the wound by the patient if possible and finally cauterization. Free excision followed by cauterization has been recommended by many.

What is actinomycosis?

It is one of the infectious granulomata, a disease common to cattle and at times to swine. It is brought about by a variety of the ray fungi known as actinomycosis. These actinomycoses are large bacilli having peculiar club-shaped extremities, similar to the tetanus bacilli, but being ten, twenty or thirty times larger.

Describe the modes of infection from this disease and give the prognosis.

The human body becomes inoculated either from cattle directly or the ingestion of food contaminated by this fungus. It may be taken in through the respiratory tract, the digestive tract or an abrasion of the skin. Most frequently it enters the system through an abrasion about the lips and it develops about the jaw and cheek. Though having no tendency to suppurate, it may become infected with pus, break down and result in an ulcer. It spreads by coutiguity of structure and may extend to the cheek, pharynx, jaw or the vertebrae. Reaching the lungs, pathological changes result. Secondary changes develop. It spreads through the blood vessels more than by the lymphatics. Thrombi form and wherever these ray fungi become blocked the characteristic nodules are formed, disease developing by metastasis then, particularly if contamination by the pus micro-organism has occurred.

Early recognition is important from a therapeutic standpoint and for a favorable prognosis of recovery. If superficial the prognosis is good, especially if discovered early and treatment instituted. Developing in the lungs or liver the prognosis is invariably fatal.

What is the treatment for actinomycosis?

When recognized excision is the only proper course; if the jaw, excise and thoroughly cauterize the wound. When it develops internally treat symptomatically.

WOUNDS.

Describe pain as a sign common to all wounds and describe the different varieties of wounds.

Pain as an accompaniment to all wounds depends on the character of the wound, the anatomical location of the wound, the anatomical structure of the part (the number of nerve filaments it contains), as to whether any important nerve, motor or sensory, is involved, and upon the individual characteristics of the patient (some being much more sensitive than others).

The pain may be referred to the wound itself or some distant part through reflex action.

Character of the Wound:—Incised wounds are least painful. The sharper the instrument the less painful the wound. An incised wound is one made by a sharp cutting instrument.

Cutting very quickly with a sharp knife causes much less pain than doing so with a dull knife and slowly.

Lacerated wounds (those made by tearing) are accompanied by more pain than incised wounds. It is an irregular incised wound.

In contused wounds, the pain is more diffused because accompanying the pain there is also a pressing of the surrounding structures. They are frequently followed by soreness.

Punctured wounds do not cause much pain as a rule.

A poisoned wound may have the characteristics of any of these wounds.

A gun-shot wound may partake of the characteristics of several forms.

A penetrating wound is one that leads into a cavity, e. g., the skull cavity, abdominal cavity, etc.

Describe haemorrhage as a common sign of wounds.

Haemorrhage depends on the anatomical region in which the wound is inflicted as to whether vascular or non-vascular. It may occur from the division of an artery (arterial haemorrhage), blood red and comes in spurts; or from a divided vein (venous haemorrhage), dark black blood; or from the division of capillaries (capillary or parenchymatous haemorrhage). The arterial and sometimes the capillary haemorrhages may be considered as active and the venous as passive haemorrhages.

Haemorrhage depending on the vascularity of a part may be slight or profuse.

An incised wound has more haemorrhage than a lacerated or a contused wound. In the latter the tissues being contused, the development of nature's haemostasis takes place more quickly than where a vessel is cut. In lacerated wounds the tearing often suffices to control the haemorrhage.

Punctured wounds, unless they strike or involve a vessel, bleed but little, if the instrument is dull, as it partakes of the character of a contused wound. The tissues are simply pushed ahead of the instrument and not separated.

Describe retraction as a characteristic feature of wounds.

This feature also depends on the tissue receiving the wound. Muscles, tendons, arteries and nerves all retract. Arteries retracting with muscle will produce a hidden haemorrhage.

The degree of retraction will depend on the relation of the wound to the retracting structures, e. g., in a muscle divided parallel to the direction of its fibres, retraction will not be as great as if divided transversely. Remember then not to mutilate any more than necessary. This is especially important in cutting into the abdominal cavity on account of the contractility.

What should be the treatment for wounds?

First, stop the haemorrhage by pressure, ligature, caustic, etc. After stopping haemorrhage, antisepsis should be carried out, and upon the thoroughness of this depends the subsequent treatment.

If sure of antisepsis close wound by suture, if not sure pack, coapt any separated structure. Separated ends of nerves or tendons should be coapted and the wound closed by secondary sutures.

Always endeavor to convert any wound into an incised one as this is the simplest form. In a lacerated wound trim off the torn edges as frequently the points are found to necrose. A punctured wound should be converted into an incised wound so as to favor cleansing and to find the extent.

Contused wounds should be thoroughly cleansed and kept from any contamination and then let alone.

Physiological rest is an important factor in the treatment of wounds. If the upper extremity is badly wounded it should be placed in a splint. If the lower extremity, the knee should be immobilized or the patient placed in bed.

The gun-shot wound depends greatly on the character of the missile or ball, the substance of which it is composed, and upon the distance at which it was fired. Ulcers and burns from powder occur when at close range. From a leaden ball there is frequently a diffusion, the wound partaking of the characters of both a lacerated and a contused wound.

Pain from an incised wound will subside in its own time. Where pain is prominent from tissue destruction, hot or cold applications or those of anodynes. Morphia is the best, anodyne if applications do not suffice. When patients appreciate the slightest degree of pain, use nerve sedatives, bromide of potash. Staphasagria often relieves.

When haemorrhage continues so long that a quantity of blood is lost, what is known as depreciation is brought about, and this can be treated by saline infusion into veins. Ligate the vein back of where the needle is to be used and admit as little air as possible, as too much air would cause thrombus and sudden death. The physiological salt solution is quickly prepared, one teaspoonful of ordinary salt to the quart of water; and a little bicarbonate of soda may be added. If a large enough vein cannot be found (in children) the solution may be injected subcutaneously.

Haemorrhage results in a loss of oxygen and a decrease in the amount of blood, leaving the heart but little to work on, and the saline infusion remedies this somewhat.

Small doses of quinine or tincture of arsenic sometimes counterbalance the haemorrhage. Quinine acts specifically on the development of the blood and stimulates the contractility of the blood vessels.

What is a complication wound?

This is a wound in which some important structure is involved--e. g., division of the main nerve of a limb, cutting of tendons, etc. These nerves and tendons should always be united, else some permanent injury will result.

DISEASES OF THE BLOOD VESSELS.

Upon what do diseases of the blood vessels chiefly depend?

They are rarely primary, but are usually dependent upon some constitutional disorder, generally syphilis, and also specific infectious diseases, and chiefly the granulomata diseases, those diseases having a tendency to formation of new tissue. Alcoholism is another frequent cause of blood changes, usually secondary to some active change or change in the heart itself.

What is endarteritis?

It is an inflammation of the internal coat of arteries, its seat being not so much in the intima itself as in the connective tissue. Peri-arteritis is an inflammation between the intima and the media.

What principle underlies diseases of the blood vessels.

The consecutive changes depend on the inflammation, be this inflammation productive or retrogressive.

Describe endarteritis.

It is a disease not confined to one vessel, but is diffused over the whole system, even involving the veins. However, it is apt to become localized when there are destructive changes in the intima, such as areas of ulceration, which take the normal course of all such changes and give rise to cicatricial tissue. This cicatricial tissue ultimately contracts and a deformed artery results, "endarteritis deformans."

Oftener the sites of ulceration and cicatrization go on with secondary changes and there is an ultimate deposit of lime salts, which is

known as an atheromatous development. When this is general an atheromatous condition of the arteries is present. This condition is found particularly in the aged and those especially addicted to alcohol all their lives.

Where the cicatrization proceeds to such an extent as to gradually fill up the lumen and finally occlude it altogether the condition is called endarteritis obliterans.

We find that this endarteritis often becomes the seat of some specific changes and senile gangrene occurs or gangrene in the young; or more sharply localized conditions may develop in the vessels themselves, such as aneurism.

ANEURISM.

What is aneurism?

It is a dilatation of a blood vessel through which blood flows.

How are aneurisms classified according to their appearance and character?

(a) Cylindrical aneurism, one consisting in a dilatation of quite an extensive portion of a vessel; (b) spherical aneurism, spherical dilatation; (c) sacculated aneurism; (d) fusiform aneurism.

How are aneurisms classified pathologically?

Into true and false or spurious aneurisms.

Mention the locations of aneurisms.

They develop most frequently in the thorax, aorta, either in the ascending, transverse or descending portion of the arch. Next in frequency they occur in the popliteal artery; then in the iliacs, the subclavian, the carotids and sometimes in the smaller arteries of the brain or lungs.

Upon what does an aneurism depend?

Upon, first, an area of lessened resistance, and, secondly, on an increased blood pressure. These cause a dilatation which depends on the extent of involvement of the media, the muscular coat. Where the muscular coat is not greatly involved there is little probability that an aneurism will develop, but the greater the extent of involvement of the muscular coat of a blood vessel, the greater the liability of a contraction of the muscle. Therefore, with an extensive involvement of the middle coat, the involvement of the muscular coat being general, we find that, as a rule, the vessel will dilate and a cylindrical form of aneurism will result. We find with it a gradual dilatation of a vessel in that area. Where the muscular coat is weakest it will dilate the most. When this reaches a great proportion it gives rise to a spherical aneurism.

A sacculated aneurism is a change in the vessel that becomes more localized; e. g., there is a small spot which the blood pressure finally succeeds in stretching, dilating the internal and external coats; and a small sac is developed. Through this we find the blood circulates, and the larger the sac becomes, the greater the tendency for coagulation to take place, so that not infrequently we find that the wall of the aneurism consists of a stretching of the coat of the external vessel, and as this stretches the dilatation is sufficient to produce a hyperplasia of the surrounding tissue, and that usually makes up the wall of an aneurism. It has then, as a rule, not the physiological construction of a vessel wall, but simply consists of a sac of connective tissue.

This connective tissue may stretch even to rupturing, and then the aneurism empties itself. If this happen into a large cavity, the haemorrhage will be large enough to prove fatal. Aortic aneurism usually terminates this way.

Again, adhesive inflammations develop, and the aneurism adheres to the lung and causes secondary symptoms.

These aneurisms also occur in the smaller vessels of the brain, and finally adhesions occur and the patient succumbs to an apoplexy. Apoplexy or cerebral hypertrophy is always the result of changes in the arteries, if not to an aneurism direct, to an atheromatous condition.

What is a cirsoid aneurism?

It is a dilatation of a whole system of vessels where small arteries may develop into very large ones. This condition is usually dependent on some congenital change, probably syphilitic in character. It occurs usually in the scalp and face and in the young.

What is an arterio-venous aneurism?

It is an aneurismal dilatation of an artery communicating with a vein. It is usually due to traumatism, developing from an injury or operative interference.

What is a racemose aneurism?

It is a tumor in which there is the development of new blood vessels. It might be classified as a tumor known as angioma.

What can be said of the coagulum forming in aneurism?

It is an effort on the part of nature to obliterate the deformity. There being no endothelial lining to the vessel wall, the roughened surfaces cause the fibrin to coagulate. This coagulation occurs as laminations and becomes quite thick. Secondary changes may occur, and pieces may be detached and swept off in the current and emboli developed.

What is aneurismal hernia?

This occurs from impairment or destruction of the external coat and more often of the middle or muscular coat also. Then the intima is pushed out through these two, and an aneurismal hernia is formed. This, as in the sacculated variety, gives rise to considerable irritation in the surrounding tissues and the development of a connective tissue capsule.

What is a diffused aneurism?

It is an aneurism caused usually by traumatism. The vessel becomes enlarged and an extravasation of blood occurs, and the opening becomes plugged. Generally, however, the haemorrhage is extensive and the newly-extravasated blood, mingling with former coagula, speedily coagulates, and this increased irritation causes an effusion of plastic matter and a proliferation of cellular tissue around the mass, forming a new sac of increased dimensions. It is a form of false aneurism.

What is a dissecting aneurism?

It is an aneurism beginning by some injury to the intima, allowing the blood to escape between the intima and media or between the muscular and external coats. It may result in a sacculated aneurism or break through into the tissues and result in a diffuse form; or it may break back into the lumen of the vessel.

The dissecting and diffused aneurisms and aneurismal hernia are usually of traumatic character. The sacculated and cylindrical varieties usually result from some intrinsic cause, diseases of the blood vessel, usually endarteritis.

How can an aneurism be diagnosed?

This is usually easy. A tumor of slow growth develops always along

the course of a blood vessel. Pulsation, rhythmical with the heart beat, eccentric, that is elicited from all portions of the tumor. Pulsation distributed to a tumor overlying a vessel is only in one direction. The vessel spreads out in every direction. A bruit is also present. Tumor increases and decreases in size, and pressure on the proximal side of the tumor causes a decrease, as the blood flows out, and if pressure be exerted on the distal side, it enlarges.

Complications as secondary changes make diagnosis difficult, especially if these changes are acute and inflammatory in character. Connective tissue around aneurism is the seat of an acute inflammation, giving rise to fluctuation simulating acute abscess. Great care is necessary here. Insert a hypodermic needle and withdraw; if blood comes, it is not an abscess.

Give the treatment for aneurism.

Medicinal:—Internal remedies to govern the heart's action and increase the coagulability of the blood. An organized coagulum filling the cavity is the only cure for aneurism. Low diet, just enough to keep patient from starving, and a drug to increase the coagulability of the blood and the fibrin, with absolute rest, have been recommended. Remedies:—Chloride of lime and iodide of potash (15-60 grains daily), with patient recumbent and on low diet. This treatment is particularly indicated in aneurism of an internal vessel.

Pressure is recommended; made by tourniquets, e. g., over abdominal aorta. The object is to retard the blood flow and thus favor coagulation. Pressure between the tumor and the heart is also used, thus decreasing the amount of blood flowing into the tumor. Manual pressure must be continuous. To press on artery satisfactorily it must be done between two inelastic substances. The danger is gangrene.

Injections of various substances into the aneurismal tumor have been made; ergot and perchloride of iron. Danger lies in a secondary infection in the coagulum so produced and a subsequent suppuration may occur, followed by a pyaemia or a thrombo phlebitis.

A steel needle and a galvanic current have been tried to produce coagulation. A spiral steel spring has been inserted, and this assists in coagulation; secondary changes may occur.

The best method is that of Antyllus, viz.: Excision after ligating the vessel above and below the aneurism; the sac is freely excised, laid open and allowed to heal as an open wound.

Anel's method is a proximal ligation of all vessels close to the sac.

Hunter's method is proximal ligation at a distance from the aneurism, e. g., ligating the femoral artery in Hunter's canal for aneurism of the popliteal artery, overcoming the re-establishing of the circulation in the aneurism, as is possible in Anel's method.

What is aneurismal varix and its treatment?

It is a condition occurring in the young. It occurs in veins communicating with an arterio-venous aneurism. The veins become enlarged, nodulated, tortuous and thickened. It should be treated by free excision.

SHOCK.

What is shock?

It is a complex condition brought about by some sudden impression upon the system. This may be traumatic or emotional in nature. It is therefore affected by either sensory or motor nerves.

It is a condition of general exhaustion, resulting from a sudden expenditure of energy of the nervous system.

Shock is more liable to follow some injuries than others, especially

those accompanied by a pressure or a crushing of tissue. Injuries involving internal cavities, as the abdominal cavity, are accompanied by shock.

Differentiate between shock and collapse.

Shock is due to an expenditure of nerve force, the other changes being subsequent to this. In collapse the primary effect is on the circulation.

Give the pathology of shock.

The changes are largely molecular, taking place particularly in the nervous system. Patient presents the following appearance:—Anemic; visible mucous membranes pale; cold, clammy sweat covering body; respirations slow and deep as a rule; pulse weak, almost imperceptible and slow; mind clear, though hard to arouse; no coma (collapse has unconsciousness); on being called loudly, opens eyes, though unable to speak from exhaustion. Then, later, pulse more and more thready; respirations more and more retarded, cease altogether; death.

With cold, clammy sweat, temperature in axilla may be 95 degrees, varying from 97 to 95, rarely below.

Recovery is first marked by stronger pulse, more frequent respiration and disappearance of pallor.

Mention the theories as to the cause of shock.

Patient bleeding into his own veins (abdominal), due to vaso-motor paralysis. This is not demonstrable in all cases, therefore untenable.

Exhaustion of ganglionic nerve cells a better theory. Experiments on birds by examining these cells before flight in the morning, and also in others after a day's work, show a difference in the physiological condition of the cells before and after a day's work. A similar condition has been demonstrated in these cells after injuries.

Describe the treatment for shock.

First, insure absolute quiet. Apply external heat; stimulate circulation and respiration. Remedies:—Atropine, strychnine, nitro-glycerine, digitalis, administered hypodermically. In addition to this, stimulants may be injected per rectum. No operative measures should be instituted as long as the patient is suffering from a severe degree of shock. Wait until reaction has begun.

Describe the varieties of shock.

Primary shock is one coming on immediately after the reception of an injury.

Late shock is more tardy in its appearance, resulting probably from injuries less grave in character.

Protracted shock is a condition long drawn out, the patient apparently feeling well, yet appreciating no reaction. The pulse is weak, respirations are slow and the case frequently terminates fatally after two, three or five days. When operative measures are indicated they should be carried out quickly.

TUMORS.

What is a tumor?

A tumor is a new formation that has no physiological limits. It is non-inflammatory in character, and its constituents differ from those of the tissues in which it develops.

What is the etiology of tumors?

Conheim's theory is probably the best. He advanced the idea that tumors originate from pre-existing superfluous embryonic cells which

are latent for a time and then develop into a tumor. Add to this the theory that there is back of it some hereditary predisposition. Senn suggested that a tumor is the result of a development of pre-natal cells or post-natal cells in a tissue in which pathological changes have taken place. Traumatism may also be looked upon as a cause, especially in a certain class of tumors.

Constant irritation may be the cause of a certain class of tumors. Hereditary predisposition, either in a direct line or through some collateral branch of the family, may also be an etiological factor.

Certain tissues and certain cells possess a greater liability to the development of tumors.

How are tumors classified?

Into those arising from the mesoblastic tissues or the connective tissue type and those arising from the epiblastic and hypoblastic tissues or the epithelial type. Also a third classification of tumors, or cysts, though most cysts are not tumors.

To the connective tissue type belong all those varieties having a tendency toward higher development of tissue. These tend to the development of mature tissue.

Those of the epithelial type have a great tendency toward retrogressive changes.

How are tumors otherwise classified?

As innocent or benign and malignant. The benign tumors are composed of more mature cells, resembling the mother tissue from which they spring, whereas in malignant tumors the elements differ in a greater or less degree from the tissue in which they develop. A malignant tumor, then, is one that is heterologous in its formation and has clinical dispositions of malignancy, having a marked tendency to spread and form new growths. These new growths form near the primary tumor or at distant parts of the body by metastasis, which develops from the fact that tumor cells are carried away by the lymphatics or blood vessels.

The term malignant also refers to changes occurring locally where the growth exists. There is a tendency toward retrogression, ulceration and sometimes secondary pathological changes, e. g., amyloid degeneration, calcification, etc.

The richer the growth is in cells the more rapid the development; and the less intercellular elements they contain the less malignant are they.

How are tumors of a specific variety classified.

Into the connective tissue type, those composed of cells near maturity, such as fibroma, osteoma, chondroma, lipoma, angioma, myoma, sarcoma, papilloma, neuroma and glioma, and into the epithelial type of tumors, carcinoma and adenoma.

Describe sarcomata.

A sarcoma is always a malignant tumor. The cells take on the form of embryonic connective tissue cells and there is almost no stroma or intercellular substance. Rapid formation is a characteristic quality of sarcomata. They tend to metastases, not by the lymphatics, but by the blood, being exceedingly vascular and their elements coming into direct contact with the blood current which flows through these tumors in simple channels.

What are the varieties of sarcoma.

According to the character of the cells forming the tumor, the varieties are:—Spindle-cell (large or small), round-cell, giant-cell or myeloid and melanotic (a peculiar pigmented condition), most malignant. The variety of cells predominating give the tumor its name. If the small cells predominate it is called a small-celled sarcoma, etc. Again,

sarcoma is called fibro-sarcoma when the mature tissue is fibrous in character. When developing from bone they are called osteo-sarcomata; when from cartilage, chondromata or chondro-sarcomata, when complicating the development of new blood vessels they are known as angio-sarcomata or angiomata.

What are the causes of sarcoma?

Sudden injuries, as contusions, are a factor in the production of sarcoma as indirect causes, the direct cause lying in the cells themselves. Sarcoma is found particularly in that stage of life when growth is not yet complete, in the young and adolescent. It rarely occurs after forty years, and no portion of the body is exempt from its development.

Give the various characteristics of the different varieties.

Spindle-cell sarcomata are usually of a firm consistency (usually periosteal in origin), are oval or pear-shaped and develop from that portion of the bone that is most active in its vegetative capacity.

Sarcoma of the epithelium is an exceedingly common disease, occurring in young children or about the age of 18-20 years. The round-celled sarcoma is more apt to be globular in outline and softer in consistency than the spindle-celled variety. Owing to the immaturity of its cells, it tends to break down and develop into cysts, then known as a cysto-sarcoma. It usually leads to atrophy of the surrounding structures. The round-celled sarcoma is particularly malignant, as is also the melanotic variety.

What is the treatment for sarcoma?

Early, thorough and absolute removal with the knife. No other treatment is excusable. Where they grow from the periosteum in young children amputation of the limb is about the only means of saving the patient. It may be chiseled off and the patient watched carefully for any recurrence at the original site. Amputate as far remote from the seat of the disease as possible.

Sarcoma of the breast usually occurs in the inner upper quadrant and the lower outer quadrant. Extirpate thoroughly. After removal build up the system by administering drugs. If not operated anodynes may be given when pain supervenes. Inoculation of the virus of erysipelas has succeeded in staying the development and led to a rapid degeneration of the growth. Where removal is impossible, inoculation is justifiable.

Describe fibroma.

This is a common variety of tumor, consisting of fibrous connective tissue. There are two varieties, the soft fibroma and the hard fibroma, the difference consisting simply in the proportion of intra-cellular substance present. They may attain an enormous size, and may be typically exemplified in tumors of the uterus. One variety growing from the sub-integumentary connective tissue tends to a multiple development, and this process is a disease called fibroma-myelosis. Fibromata are entirely innocent growths, they are sharply defined, have no tendency to infiltrate surrounding structures and usually produce symptoms only in proportion to their size and location, occurring sometimes, when in the uterus, without the individual knowing of it. When large they press on the blood vessels. Uterine fibroids are at times accompanied by profuse haemorrhages at or between the menses.

What is the treatment for fibromata?

Removal, depending on the location, may be made by enucleation. This must be complete or a re-development at the original seat may occur.

When pedunculated, as in the cavity of the uterus or the nose, they may be removed by snaring or, as the French suggest, by applying

specially devised forceps and cutting away piecemeal or tearing away. In removing fibromata try to take away some additional structures.

Describe lipoma and give its treatment.

It is an aqueous or fatty tumor with a fibrous stroma, and, depending on the amount of this stroma, it has a more or less globular appearance. It occurs at any period of life, is slow in growth, growing by spells. It may rapidly increase in size for weeks and then cease, and later on grow again. They are found most usually in the back in the region of the shoulders, in the buttocks, loins, arms, or face, and also the omentum. They occasionally develop from glands, as in the testicle (rare).

Treatment:—Removal. At times this variety undergoes retrogressive changes. It may become infected, suppuration take place and the tumor suppurate away; or cysts may develop. Removal is advisable from its tendency to secondary changes.

Describe papilloma and give its treatment.

This is a tumor consisting simply of a hyperplasia of the papillary layers of the skin and classically exemplified in an ordinary wart. This variety also occurs in the respiratory tract, the most frequent tumor of the larynx being papillomatous. They always have a tendency to develop with a pedicle. Another favorable location is in the bladder, and, at times, the lower bowel.

Treatment:—Indication for removal depends on its location. If in the larynx this may cause a stenosis. The papilloma is not infrequently the starting for an epitheliomatous development, hence removal is advisable. In the bladder they are characterized by bleeding, which may be serious. It is often a cause of haematuria..

When small they have been known to disappear under the action of thuja.

Describe osteomata and their treatment.

These may be either of two varieties, the hard or ebonated variety, composed of the compact bony structure, or those consisting mostly of cancellated structure. They usually spring from bone, but occasionally they develop in muscle sheaths. They are found in cavalrymen as bony developments of the thighs from constant irritation of the saddle. Do not confound with exostoses, which are simply excesses of bone development. They are usually globular, round or oval in outline and may spring from any bone, particularly the flat bones, and especially those of the skull. Springing from the inner table of the skull, very grave symptoms may result. Their removal implies a difficult operation and unless they cause symptoms they may be left alone.

What is a chondroma.

It is a tumor composed mostly of hyaline cartilage and occurs most frequently in youth, developing particularly from the epiphyses of long bones. They may reach large proportions and tend sometimes to become cystic and at other times to develop in conjunction with osteomata (osteo-chondroma). It is an innocent growth, though when infringing on joints the serious symptoms it produces may require removal.

Numbers of them develop about the fingers, from the ear and nasal cartilages. They do not tend to recur after removal.

What is a neuroma?

It is a tumor composed of connective tissue and surrounding a nerve, having comparatively few nerve cells in its structure. They have a tendency to develop at the ends of divided nerves, hence are met with after amputation (amputation neuroma). Here they are pear-shaped, of varying size and very painful, causing patients to discard

any artificial apparatus they may be using. They also develop after injury to a nerve without loss of continuity and are here extremely painful. Treat by removal.

Describe a glioma.

It is a tumor consisting of nerve tissue found in the brain and resembling very much a granulation tissue. It is soft, grayish-white, very vascular and at times reddish in appearance. It is apt to be diffused. When there is a large amount of stroma (frequently partaking of the character of sarcomatous tissue), it is known as a glio-sarcoma. Then they are more defined and usually round, varying in size to that of a hen's egg. They develop in the brain, eye and retina.

Describe the epithelial type of tumors.

They are the most malignant of all tumors. They exhibit a marked tendency to take on the development of a gland. The higher their development the greater the similarity between the growth and the gland. Hence they are histologically similar to adenoid tissue. The higher the type of the tumor the less malignant is it. The epithelial tumors are characterized by a stroma (which predominates in some varieties). This is nearly always fully developed tissue, hence it is not inherently malignant as a part. The greater the cellular element there is the greater the malignancy.

Describe an adenoma.

This is a tumor representing most typically the new gland form, save that it has no function and the development of ducts is rarely found. It may develop at any time of life and most frequently in connection with glandular structure, mucous glands, hence found in mucous membranes, especially the lower bowel, and the female breast (here frequently in the earlier years of life). Though not tending to grow large, it tends toward cyst formation, developing by retrogressive change. Then known as a cysto-adenoma. It is probably malignant, being indistinguishable from carcinoma and having a tendency to carcinomatous degeneration. In connection with lymphatic glands it is called lymphadenoma. In adenoma there is a basement membrane for the development of cells, thus always presenting the typical glandular appearance. This is all that distinguishes it from carcinoma, and if it disappears a carcinoma is present.

What is a carcinoma? Describe its varieties.

It is an atypical epithelial cell proliferation.

One variety is composed entirely of epithelial cells, with little or no stroma. The cells being embryonic, proliferation is most rapid, and with this the older cells take on a marked addition. This tumor infiltrates surrounding structures to a marked degree; hence, it is malignant. It does not grow within itself. Therefore, unless a carcinoma be treated early it is useless to endeavor to treat it.

Another variety has a firmly built stroma with a group here and there of cancer cells in V-like masses. This is the scirrhus or fibrous carcinoma. This stroma tends to contract inherently, spreading out the epithelial elements in so doing. This variety also has a great tendency to develop in glands, especially the female breast.

Another common variety is the superficial carcinoma or epithelioma. Varieties:—Superficial and deep. Deep tends to grow deep into the surrounding structures. Superficial to spread on the skin. Deep appears most frequently at the junction of the mucous membranes with the skin, lip, nose, anal region, classical type in uterus usually beginning at the os.

What are the causes of carcinoma?

Constant irritation of a part, especially a cause in "chimney sweep's cancer," or in smoker's cancer of the lip.

Hereditary predisposition through direct line or collateral branches.

Bacterial origin not yet proved.

Mention the seats where carcinoma may be found.

The glands, the most common seats. Internal organs. Females particularly. Uterus, female breast, liver, stomach, upper air passages, lips, lower end of alimentary canal, about the anus, lower bowel and finally the superficial lymphatics.

Describe the growth of a carcinoma.

Growth rapid, depending on variety. In a gland, rapid enlargement, outlines soon lost. No limiting membrane. Tendency to metastases differing from those of sarcoma by developing in the lymphatics.

How can carcinoma be diagnosed?

Any tumor occurring after forty years of age, growing rapidly, of glandular origin, or in the vicinity of glands should be diagnosed as carcinoma unless it can be proven exclusively otherwise. This should be done because the growth of carcinoma is so rapid that a short time will make mechanical interference hopeless. Excision is the only treatment.

In the uterus the cervix is almost invariably the seat of laceration, resulting in scar tissue or erosions, which lead to the development of the epithelial variety of carcinoma. Treat the erosions before they become carcinoma. A nodular granular appearance, with slight bloody discharge, are indications enough for radical or heroic measures. Remove the uterus in toto by a vaginal hysterectomy. Reaching the vaginal wall, it spreads, rapidly infiltrating the bladder, making operative interference useless. However, curettage may be done and cauterization with thuja.

Carcinoma of the body of the uterus is rarely found without involvement of adjacent organs. Operation is useless here, as the patient succumbs to the gravity of the operation. Inoculation of erysipelas virus may be tried or the injection of the aniline dyes.

Remedies:—For the general system, arsenic, as it antagonizes tissue metamorphosis. Chloride of sodium, chloride of gold. Also prescribe symptomatically. Pain must be combated by anodynes, beginning with the mildest form in very minute doses. Morphia, one-fourth grain in four or five teaspoonfuls of water, a teaspoonful until pain is removed.

Carcinoma of the breast:—Over 88 per cent. of breast tumors are carcinoma; of the remaining 12 per cent. sarcoma represents 4 per cent. and adenoma 8 per cent. After the menopause the female breast is a useless organ, and carcinoma may be diagnosed and you will err on the safe side. Carcinoma may follow suppurative inflammations of the breast. Amputation for abscess of the breast is not too radical a procedure. See operative treatment for carcinoma of the breast under General Surgery

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FRACTURES.

What is a fracture?

A fracture may be defined as a solution of continuity of bone. It is derived from the Latin frango, fractum, to "break."

Give a classification of fractures as to tissues involved.

They may be of bone or of cartilage.

Give a classification as to character.

Complete, and incomplete or partial.

Give classification as to number.

They may be single, multiple or comminuted.

Define single, multiple and comminuted fractures.

A single fracture is one in which the bone is broken in but one place.

A multiple fracture is one in which the bone is broken in more than one place.

A comminuted fracture is one in which the bone is broken or crushed into several pieces.

Differentiate between a simple and a compound fracture.

A simple fracture is one in which the bone only is divided, without other injury or any external wound.

A compound fracture is one in which the fracture of the bone is accompanied with laceration of the integuments, causing an external wound.

Mention some complications of fracture.

A dislocation; a laceration of the soft parts, such as nerves, arteries, veins, etc.

Classify fractures according to direction.

Transverse, oblique, longitudinal, V-shaped and T-shaped.

What are the most common?

The transverse and the oblique.

Describe the various fractures possible in flat bones.

Indented fracture:—One in which the bone is simply indented, as the outer skull plate into the diploe.

Fissured fracture:—One in which the bone is simply cracked.

Stellate fracture:—One in which the lines of fracture radiate.

Dentated or serrated fracture:—One edged with projections like saw teeth.

Mention the displacements of fracture.

Angular displacement:—One in which the fragments are bent at an angle.

Overriding:—One in which one fragment slips over the other.

Rotary displacement:—One in which a fragment or fragments are rotated.

Impacted:—One in which the fragments are driven into each other.

We may have a combination of any of these forms.

What are some of the combined misplacements?
An angular displacement with overriding.
An angular displacement with a rotary.
A rotary displacement with overriding.

What are the two principal causes of fractures?
Predisposing and exciting causes.

Give the predisposing causes.
Sex. Females are less liable to fractures than males.
Season. More liable to fracture when ground is slippery with snow or ice.
Certain bones. Clavicle, radius, ulna and fibula.
Age. Green stick and epiphyseal fractures are common in children. In old age the bones are brittle.
Occupation. Wherever violent exercise is necessary or there is liability to accident.
Hereditary or acquired fragility. Families are recorded in which almost every member has suffered from numerous fractures. A disease may produce certain changes in a bone which predispose to fracture, e. g., syphilis.
Certain cachexias. Slight injury may cause fracture when there is interference with the nutrition of the bone. Common in the insane.

Mention the exciting causes.
External and internal violence.

How may a bone be broken by external violence?
By direct or indirect violence. It is direct when a blow has been applied to the spot where the fracture occurred. It is indirect when violence has been applied through the medium of some other part at a lesser or greater distance from point of fracture, e. g., falling upon feet from a considerable height, might fracture the base of the skull.
By torsion:—As in Pott's fracture.
By cross-strain:—As in fracture of the patella or the olecranon.
By intra-uterine violence:—The uterine contractions upon foetus may cause fractures therein.

How is internal violence a cause of fracture?
A bone may be fractured by muscular action, e. g., the patella, as in kicking; also the humerus by the act of throwing. This is known under the term arranchement.

What is a pathological fracture?
A fracture occurring from a diseased focus in a bone, and here but little force is required. Often found in malignant growths, viz., secondary carcinoma and medullary sarcoma (the latter being characterized by the egg-shell crackling).

Mention the causes of fractures in the new-born.
They are often produced by the obstetrician, or they may occur before labor begins, due to violence in utero. If fracture be found united at birth, it necessarily occurred in utero.

What are the subjective symptoms of fracture?
History, pain and loss of function.

What is meant by the history?
The narration of the case by the patient or bystanders. From this a tentative diagnosis can often be made.

What are the distinctive characteristics of the pain in a case of fracture?

It is sharp, cutting, intense and agonizing. Pain in dislocations is dull and more benumbing. The pain may be localized or referred to some other part. When pain is felt at a spot other than that where fracture occurred, it is called "referred pain." Example:—Injury to the spine may cause pain in parts where spinal nerves terminate.

Is loss of function always an absolutely reliable sign?

No; some patients may be able to walk in case of impacted fracture of femur, or when but one bone of the leg is broken. Loss of function in a part may be due to injury elsewhere. (Patient may be unable to walk in fracture of the spine).

What are the objective symptoms found in fracture?

Deformity, abnormal mobility, recurrence of deformity after reduction.

What kinds of deformity should be remembered?

Local and general deformity and that coming on later; swelling, ecchymosis, and shortening.

What causes swelling in fracture?

Haemorrhage and inflammatory transudation. Swelling is apt to obscure the symptoms, therefore the case should be seen as soon as possible.

Describe the characteristic ecchymosis accompanying a fracture case.

Ecchymosis is characterized by various colors, differing according to the depth of the injury. When appearing soon, it is generally due to a laceration of the small, rather superficial vessels. When coming on after four, five or six days, it is due to a deep-seated laceration produced by the fracture. Such a laceration is characterized by green and yellow discoloration, the blood having lost some of its coloring matter on its way to the surface.

How can shortening be ascertained?

The best method is by the comparison of the length of both limbs by mensuration.

Is shortening an absolute sign?

No; the well limb may have been fractured or one limb may normally be as much as an inch shorter than the other.

Mention some of the special deformities occurring in fracture.

An outward rotation of the limb in fracture of the femur. The characteristic deformity of a fractured clavicle. Silver fork deformity in Colles' fracture.

What are the pathognomonic symptoms of fracture?

Abnormal mobility, crepitus and recurrence of deformity after reduction.

What can be said of abnormal mobility?

Abnormal mobility may not always be found in some fractures, and at other times it can only be recognized with great difficulty.

Define crepitus and give its value in diagnosis.

Crepitus in fracture is the grating sensation produced by the ends of a fractured bone being rubbed against each other. It may be moist, dry or bony. When moist it is significant of a cavity containing fluid (joint). Dry crepitus is found in the first stage of an inflamed tendon (a similar sound is also found in the first stage of pleurisy). Bony crepitus is hard.

How can an obscure fracture be distinguished from an obscure dislocation?

Recurrence after deformity is used to distinguish these injuries. It occurs only in fracture.

In diagnosing fractures, from what injuries must they be differentiated and how?

Fractures must be distinguished from bruises and dislocations. In bruises, no shortening, no abnormal mobility, and no dislocation are found. Abnormal mobility, crepitus and recurrence after reduction are pathognomonic to fractures, while abnormal immobility and non-recurrence after reduction are prominent symptoms in dislocation.

Give proper method for examining a fracture case.

Be gentle. Clothes are best removed by cutting. Ascertain the history. Gain the confidence of the patient and divert the mind. If impossible to do this, anaesthetize. Inspect, measure and compare. Percussion is occasionally used, most frequently in fracture of the fibula. Lastly, manipulate, but only with a definite object in view.

Describe the process of the repair of fractures.

The process of healing or repairing of fractures is much like that in other tissues, and the cicatricial tissue is just as good as the original bone. In long bones, repair may be considered under four principal heads—1. Formation of clot; 2. Granulation tissue; 3. Bone formation (filtration of lime salts); 4. Absorption of inflammatory products.

1. After a fracture, haemorrhage occurs under the periosteum, which is usually not completely lacerated, and in the medulla. This forms a clot usually known as the grapevine.

2. Next takes place the formation of granulation tissue, which develops from the most vascular portions of the bone, viz., the periosteum and the medulla. This forms a sheath around the bone and a plug within, which is known as Nature's splint or "provisional callus." If excessive, it is called "exuberant callus." This occurs from eight to ten days after the fracture.

In from three to seven weeks after the fracture, inflammation and rarifying osteitis are set up, and granulation tissue is thrown out between the ends of the fragments. This is known as "definitive callus."

3. Bony salts are thrown out two or three weeks after each callus has formed, and these are changed into true bone by a connective tissue process. This requires from one and a half to four months.

In from seven to twenty-six weeks after the fracture Haversian systems are formed by cartilaginous or granulative processes.

4. Lastly, there is an absorption of the excess from the callus and the surrounding soft tissues. This occupies from six to twelve months.

The fragments may unite by definitive callus alone, and this is called union by first intention. They may also unite by provisional callus, or by both definitive and provisional calluses, which is more common. Union may also occur by intermediate callus when the fragments are inaccurately set.

Non-union results from a lack of definitive callus, and fibrous union from a lack of salts.

How does the repair of flat bones differ from that of long bones?

The periosteum adheres closely to the flat bones and breaks readily with the bone, so that no clot formation is possible, and the definitive callus forms early.

How is the repair of fractures within a joint often modified?

The extremities of long bones having a cancellated structure like that in flat bones, repair takes place similarly. Sometimes, also, carti-

lage or the synovial fluid penetrates between the fragments and prevents union. There is also a theory that the callus when exuberant grows out into the joint and interferes with motion, but it is held that the projection is due to imperfect reduction. Union is deferred longer by reason of a scarcity in the blood supply.

How is repair accomplished in a compound fracture?

If a compound fracture can be quickly transformed into a simple one, and the wound heals readily, the repair takes place as in a simple fracture. If this is impossible, if bits of bone die and are cast off, or if sepsis sets in and the wound does not heal, a long and unfavorable course and a possible non-union will result. Union may be deferred by necrosis and fibrous union is common, being due to interference and drain on the system. The surrounding cicatrices may be excessive and interfere with function.

Pus may burrow up and down the limb, and septicaemia and pyaemia may result, with a possible loss of life.

What is an epiphyseal separation?

It is a fracture occurring at the junction of the epiphysis and the shaft, and is common in growing bones during childhood and youth up to the fifteenth or sixteenth year.

What is the usual result?

The family should be warned that the fragments will be long in uniting. If supplemented by an inflammatory condition, there will be a deposit of lime salts and union will occur too early, and the bone stop growing in length. This should be remembered, especially in fractures of the lower extremity. Sometimes the other epiphysis will do the work and grow more rapidly (Nature's way of preventing shortening).

How do fractures of cartilage unite?

Articular cartilage does not unite when once separated. Ordinary cartilages tend to ossify and, as the person grows older, will unite.

Give the general treatment for fractures?

It is the surgeon's duty to warn the family that with all skill, the fractured limb will not be as good as before.

Treatment may be described under two principal headings, the reduction of the fracture and the retention.

What is reduction and how and when should it be accomplished?

Reduction is the approximation of the broken surfaces in the position in which they are to heal. This, as a rule, is not difficult, but the fractured ends are rarely set accurately. However, Nature's intermediate callus renders this condition insignificant. Fractures should be reduced as soon as diagnosed. This is accomplished by extension, counter-extension and manipulation or coaptation at the point of injury. In green-stick fracture, bend the bone back; in patellar and acromial fractures, draw the fragments together.

Mention the impediments to a proper reduction.

Impaction, intervention of small fragments and of soft parts, muscular spasms.

What should be done in a case of impaction?

If the fragments are in a good position, do not interfere; if otherwise, reduce as above.

How can small intervening fragments be recognized and treated?

They are recognized by manipulation and the X-rays. If the difficulty cannot be overcome by manipulation, the piece should be removed.

How should fractures be treated when soft parts intervene?

Manipulation and traction may be of value, but care should be exercised not to mutilate the parts. If a muscle intervene, relax it.

How should muscular spasms be overcome?

Spasm of the muscles always occurs, and is frequently the result of incomplete reduction. It may be overcome by gentle traction, by directing the attention of the patient elsewhere, and by the position of the part. If the arm be fractured, it may be flexed. Spasms often come on at night, causing great pain and necessitating the use of opiates. They often occur after reduction, and here, if persistent, weights should be used. If the spasm cannot be overcome, resort to a general anaesthetic. Tenotomize if necessary.

What is meant by retention and what is its purpose?

It is the holding of the parts in position while healing. Its purpose is to hold the fragments, to overcome muscular action, to prevent sagging and to prevent motion between the fragments.

How can retention be accomplished?

By the fixation of the fragments and by keeping the two adjacent joints still. This may be accomplished by the use of bandages, adhesive strips, splints or fixation apparatus. A preliminary bandage is of little value and often does harm by causing gangrene. Splints may be of wood, pasteboard, felt, leather, rubber, flexible wood, or perforated tin. Fixation apparatus may be in the form of a special box or plaster of Paris.

What is the constitutional treatment for fracture?

Give the patient the benefit of good hygiene. Keep the bowels open and examine the urine regularly. Watch for bed sores.

Use ice bags to control inflammations and bichloride of mercury poultices if suppuration threatens.

Remedies:—Arnica, internally and externally; symphitum or calcarea phos. to stimulate bone formation; bell. and hepar in inflammatory conditions; hyoscyamus for nervous symptoms; hypericum in nerve injury; arsenicum for anaemia; opium, crude or potentized, for muscular spasms or pain (when in dilutions it also relieves constipation).

Give the treatment for compound fractures.

Reduction, retention and the treatment of the wound.

How is reduction accomplished?

If a fragment project, clean, scrape, render aseptic, and use extension and counter-extension. If fragment be irreducible, excise. Anaesthetization may be necessary.

How should loose fragments in compound comminuted fractures be treated?

The treatment depends on the locality. If in the face, fragments may be left, even though almost detached; if in the leg or arm, they should be removed. If attached to the periosteum or soft tissues, allow to remain, as they often unite and give additional strength.

What should be remembered when tenotomy becomes necessary?

Divide only such tendons as are not ensheathed. Sheathed tendons do not, as a rule, unite.

How is retention accomplished in compound fractures?

Special brackets may be necessary. Splints and plaster of Paris are also used, and, if necessary, they should be fenestrated, the object being to immobilize the fragments and yet permit of inspection and the treatment of the wound.

Describe the treatment of the wound in compound fracture.

Use mechanical and chemical measures energetically and make antisepsis as perfect as possible. Anaesthetize and scrub thoroughly with soap and brush. If the wound be ragged and dirty, enlarge and scrape; and if jug-shaped, enlarge and get the best possible drainage. If positive that the antisepsis is perfect, sew up tightly; if not positive, pack and drain for twenty-four to forty-eight hours. To make drainage complete, counter-openings may be made. If suppuration becomes inevitable, the stitches should be removed and the whole part immersed in a bichloride of mercury solution, 1-4000, for twenty-four or forty-eight hours. In inflammation, use ice packs or hot antiseptic fomentations. If fracture be of shoulder or hip, employ continuous irrigation.

What are Cowley's aphorisms or the ten commandments for the treatment of fractures?

1. Set and dress early unless contra-indicated.
2. Apply no preliminary bandage.
3. Only apply temporary dressings when permanent dressings are impossible.
4. Immobilize the broken ends and the two adjacent joints.
5. Pad splints well especially about projections.
6. Bandage snugly, but not tightly enough to interfere with circulation. Allow for swelling when applying the bandage for the first time.
7. In bandaging the extremities, always leave fingers and toes free for inspection, as they serve for guides as to the circulation and the position of the part.
8. Let comfort be the guide.
9. See patient early and often, but dress rarely (every third or fifth day).
10. Make passive motions when fracture is near a joint; otherwise they are useless. Make active and passive motions when tendon sheaths are inflamed.

Give what might be called the eleventh commandment.

Be gentle.

COMPLICATIONS OF FRACTURES.

Mention and describe the complications of fractures.

Oedema; primary and secondary.

Primary oedema is due to a crushing force, the bandage, or the position of the limb. It passes off in a few days.

Secondary oedema comes on later, after the cicatricial tissue contracts, and is due to a strangulation of the veins (by the ends of the bone or the callus) causing interference with the return circulation. It is called "oedema indurativum," or hard oedema, because it does not pit on pressure.

Gangrene:—Uncommon. It may be due to a tight bandage or the pressure of a splint or the callus on the nutrient artery, or to a crushing force so great as to kill the tissues themselves. When the effusion of serum and blood is so great as to strangle the part, moist gangrene results.

Bed sores are found mostly in old, thin, and poorly-nourished persons. Treatment: Care for the skin; keep the wrinkles out of the clothes; move the patient several times daily; protect the prominent parts with pads; harden the skin by bathing with alcohol and alum; powder with boric acid.

Stiff Joints:—They result from inflammation which may be caused by the ends of the bones penetrating the joint, or from fracture near the

joint or extending into it. When fracture occurs, there is usually a concomitant sprain of a joint. Treatment: Time may effect a cure. When joint itself is not affected, it may be immobilized without loss of function. If joint be involved, move daily. If due to a badly set or a misplaced fragment, nothing much can be done for it.

Muscular Atrophy:—It occurs especially in the anterior muscles of the thigh, in cases of patellar fracture, and should be recognized immediately. Treatment: Restore by stimulation—massage, Farradism, muscle beating and passive motion. Remedies: Strychnine and nux vomica.

Injuries to Vessels:—Thrombosis or a laceration of the vessels occur and are recognized by a tumor, ecchymosis (extensive), absence of pulse below the fracture if the vessel be completely cut; if incompletely cut, there may occur a traumatic or a dissecting aneurism, which should be treated as elsewhere.

Injuries to Nerves:—The nerves may be pinched or stretched, and, as a rule, are not completely destroyed, the paralysis passing off in time. The ulnar and musculo-spiral nerves are especially liable to injury because of their position. Treatment: Stimulate by electricity, using the Faradic current. If completely severed, cut down and tie together. Give hypericum internally.

Excessive callus:—A frequent complication. Assure the patient that most of it will pass away in time. This is especially true in the young. Treatment: Use absorptive electricity, viz., the galvanic current. Alternate hot and cold douches. Massage.

Mention some general complications of fractures.

Delirium:—Probably due to a slight uraemia or to alcohol in alcoholic subjects. Patient should not be tied down, but restrained by muscular force.

Septic Inflammation:—It occurs around the bones and at the ends in compound fractures. Death of the bone may result.

Irritative Low Fevers:—Hypostatic pneumonia may occur from lying on the back for a long time. It is found especially in the aged. Get the patient up and out.

Albuminuria:—It may be found after any injury. It is transitory.

Chyluria:—Fat in the urine is found especially after large fractures and is due to the absorption of fat by the veins. It may find its way into the capillaries and form capillary emboli of the spleen or the lungs, etc. In the lungs it is called "pulmonary fat embolism." It may result in death.

Give the complications of compound fracture.

Osteomyelitis, septic inflammation, necrosis, septic gangrene, septicaemia and pyaemia. All are caused by sepsis.

SEQUELAE OF FRACTURES.

What are the sequelae of fractures?

Vicious union, delayed union, and non-union.

What is meant by vicious union, and what are its varieties and treatment?

It is union with a deformity interfering with the beauty or usefulness of the part. The surgeon is always blamed and it may be due to him through improper setting or to other causes, e. g., motion during treatment or yielding of the callus in delayed union.

Varieties:—Angular, longitudinal with overriding, and rotary.

Treatment:--Endeavor to reduce by traction and manipulation. If impossible to do this, resort to osteoclasis (breaking a bone) and reset, or to osteotomy (cutting a bone), removing a section, or chiselling.

What is delayed union? Give its causes, varieties and treatment?

A union not occurring until 5—7 months after the fracture. It generally means non-union. It occurs about once in 500 to 700 cases. Non-union occurs in order of frequency in the humerus, the femur and the tibia. In the femur and tibia there is frequently a combined non-union and a giving of the callus because of weight.

Causes: Constitutional and local.

The constitutional causes are advanced age, mal-nutrition, improper hygiene, pregnancy and lactation (from constant drain on the system), scurvy (practically unknown to-day), phthisis, following typhoid fever any disease or growth draining the system, as carcinoma, sarcoma, syphilis in malignant form.

Local causes are bad setting, enervation of the bone through injury to the nerve, degeneration through syphilis or tuberculosis, which cause softening of the bone; interference with blood supply, pressure of splint on newly-formed callus, primary or secondary tumors, surface erysipelas, excessive inflammatory action, gummata, caries, etc.

Varieties:—Complete, resulting from absolute lack of formation of any callus, or, more frequently, a lack of definitive callus. In either case the ends of the fragments become rounded off, smooth and ebonated, and a false joint may occur. Variety rare.

Incomplete, resulting from an effort at union with formation of fibrous tissue and no ossification, though it may become cartilaginous.

Treatment:—Assist Nature by general and local measures to form callus and deposit lime salts.

General measures: Regulate the diet, give patient fresh air and proper hygiene. Give remedies for constitutional trouble or calc. phos. or symphitum to assist bone formation.

Local measures: In delayed union, immobilize the limb completely. In non-union, active surgical interference is called for. If the immobilization is good, stimulate the blood supply, using a tourniquet or the Esmarch bandage to impede the return of the blood (do not treat too long in this way). Massage and friction may be used, rubbing the ends of the bone. If necessary, anaesthetize and bend the fragments at right angles. After sawing off the ends, fasten the fragments together with silver wire and an ivory peg in the medulla. A daily injection, hypodermically between the fragments of 5 to 10 gtts. of a 10 per cent. solution of chloride of zinc is recommended by some. Repeat the injection for two or three weeks with the limb perfectly immobile. Electricity. Transplantation is not very successful; procure bone from young subject.

SPECIAL FRACTURES.

Why are not the fractures of the skull considered under the general head of fractures?

Because these fractures owe their importance to the contents of the skull and are therefore considered under general surgery in connection with the nervous system.

FRACTURES OF THE BONES OF THE FACE.

Describe fractures of the nasal bones.

They are common, and may be of one or both bones, and are often complicated by fractures of the septum or the perpendicular or cribri-

form ethmoidal plates. The fracture may be internal or external and may separate the bones from the cartilage. The causes are direct or indirect violence.

What are the symptoms of fracture of the nose?

Deformity is common and may be external or internal, deviation occurring to either side, or the fragments being driven in. These fractures are almost always compound, communicating internally through the nasal mucous membrane. There may also occur a separation of the triangular cartilage which helps to form the septum, in which case there is a falling down of the nose.

Mention two points to be remembered in fractures of the nose.

First, that the deformity is liable to be overlooked because of the early swelling; and, second, that if delay is made until after the swelling has disappeared, the fracture may be found united and irreducible. The fragments may unite in one week, so the time for setting is short.

How is sepsis prevented in nasal fractures?

It is very hard to render the nasal cavity absolutely aseptic; however, there is an abundance of phagocytes present which will often prevent infection and necrosis. The cavity may be washed out often with a fresh rose-colored solution of $KMnO_4$ or with a salicylic acid solution.

Describe the treatment of nasal fractures.

This should be early. Reduction may be accomplished by an instrument within the nose and manipulation without. If simple reduction is insufficient, it may be necessary to plug one or both nares, or fasten securely with steel pins. Adhesive plaster may be applied externally, but dressings are superfluous. After disinfection (vide supra), pack cavity lightly with gauze. See patient daily, and upon discovery of any deformity, remove the fragments. When septum only is fractured, it can be diagnosed by internal and external inspection and sharp ridges and a torn mucous membrane can be seen. It is reduced by special instruments, such as a clamp.

Name the complications of nasal fractures and give their treatment.

Epistaxis. Plug the nares.

Cellular emphysema. It will heal of itself, so no treatment is necessary.

Describe fractures of the malar bones giving causes and symptoms.

These fractures are rare and are caused by external violence, such as blows, falls or kicks from horses. They are apt to be compound, the fracture being visible by enlarging the wound. If not compound, depression and deformity are diagnostic symptoms. Mobility is occasionally present and may be found by manipulation with one finger in the mouth and one outside.

Mention the possible complications in malar and zygomatic fractures.

Orbital involvement with injuries to vessels and nerves, a loss of sensation resulting when nerves are injured; crushing in of the anterior wall of the antrum; interference with the action of the jaw.

Give the treatment for these fractures.

Save the pieces, as they generally unite. Unless there is marked deformity or complication, it is better to let it alone. If compound and there is marked deformity, reduce the malpositions by an incision and an elevation of the pieces by means of blunt hooks, corkscrew, periosteal elevator, etc.

Describe fractures of the superior maxilla.

Causes: Severe direct violence or a fall.

Varieties: These fractures may be of one or both bones; or, there may be a separation of the sutures. Often complicated by fractures of the cranium at its base. Displacement usually a backward one. They are usually compound outside and inside.

Prognosis: Repair in about three weeks. When both bones are broken 16 per cent. die from sepsis, exhaustion or necrosis. Fracture of the malar process is apt to be complicated by obliteration of the lachrymal canal.

Treatment: Save the pieces. Use Wiseman's hook in double fracture. Do not draw the teeth. Use an interdental splint. Wire the teeth together. Use the lower jaw as a splint. Much manipulation is necessary. Apply lateral pressure by pads. It is usually necessary to feed the patient through a tube. Keep the mouth clean.

Describe fractures of the inferior maxilla.

These fractures are the ones most frequently found in those of the face, usually occurring in males between the ages of twenty and thirty.

Causes: Direct violence. Blow or kick. Drawing teeth (here splintering of the alveolus). Predisposing cause is an absence of the teeth and atrophy of the alveolar processes.

Location: 1. Symphysis (three displacements); transverse. 2. Mental foramen (oblique and transverse). 3. Junction of body and ramus or ramus (line from in front, backward and outward). 4. Neck of condyle (seldom). Coronoid process (very rare).

Character: Compound, multiple, comminuted.

Symptoms: Subjective—History, loss of function, pain. Objective—Look for irregularity in line of teeth. Abnormal mobility (usually crepitus), examine with fingers inside and outside.

Complications: 1. Displacement of symphysis (little or none). Lateral displacement possible. One fragment may be displaced backward. 2. Displacements at mental foramen: Anterior fragment pulled inward. 3. Displacement at angle of jaw: Usually considerable. Upper fragment pulled in by action of internal pterygoid. 4. Sepsis very hard to prevent. 5. Sinuses form which persist. Clean the mouth with mild antiseptics, viz., chlorate of potash, borax, permanganate of potash, listerine, etc. 6. Suppuration. 7. Inflammatory action in bone (necrosis). 8. Numbness along distribution of the inferior dental nerve.

Prognosis: Ultimately good. Even with loss of teeth, have good union. Union in three weekes; pretty firm union in ten days. Non-union rare. It usually unites best of all fractures.

Treatment: Reduction—Manipulate inside and outside. Leave the teeth alone. Retention—This is easy when the fracture is at the symphysis, difficult when at the side, and especially so at the ramus. Hold the mandible against the upper jaw. Barton's, Gibson's or the oblique bandage may be used; also a chin trough and an interdental splint. The teeth may be wired, or, if irreducible, cut down and wire the bone. Feed the first ten days through a tube. Wash the mouth.

Describe fractures of the hyoid bone.

Causes: From attempts at strangling or hanging or in swallowing.

Varieties: Most often of the cornua; seldom of the body.

Symptoms: Pain on swallowing; loss of movement; great swelling; mobility; dysphagia; dyspnoea due to oedema. of the glottis; sometimes bleeding into the mouth (perforation by fragment).

Treatment: Reduction—With finger inside, manipulate outside. Retention—Use no dressings. Stop movements of tongue and swallowing. Give soft diet through a tube. Fight inflammation.

Describe fractures of the cartilages of the larynx and trachea.

Causes: Direct violence.

Symptoms: Hoarseness; laryngeal cough; haemoptysis; swelling; difficult breathing; deformity. Danger, oedema.

Treatment: Perform tracheotomy at the first sign of hoarseness. Reduction—Through wound, or by manipulation, or by cutting down on fragments and wiring them.

Describe fractures of the sternum.

These are rare, usually occurring with other lesions.

Varieties:—Body. Diastasis of manubrium. Bending backward of the ensiform.

Causes: Great violence. Occasionally muscular force. Falls or blows. Pregnancy, from straining. From forcible bending of the body backward.

Symptoms: Those of fracture and of any organs the fracture has injured. May affect heart, lungs, etc. Deformity. Mobility on breathing. Crepitus. Pain. General symptoms of pressure on heart or lungs. Rupture of the posterior periosteum may take place, and pus go into anterior mediastinum. Emphysema.

Prognosis: Depends on injury to heart or lungs. Union in about four weeks. Fibrous union common. Non-union rare.

Treatment: Reduction—Manipulation and deep respirations. Unless complicated can leave alone; otherwise, employ cutting. Retention—Broad bandage around chest. Avoid coughing. Fight the inflammation. Keep up the strength of the patient.

Describe fracture of the ensiform cartilage.

The displacement is usually downward or upward. Severe symptoms of the stomach or diaphragm may supervene. Retain the fragments by giving the chest rest (broad band around the chest). Avoid coughing.

Describe fractures of the ribs.

Fathology: Usually in adults. In children usually a green stick fracture (4-5-6-7-8-9). Only when a number of ribs are broken will there be overriding or shortening. The first three ribs are protected and fractures of these are, therefore, rare. The floating ribs being mobile, fractures are rare.

Causes: Direct violence—Causing inward displacement and fracture at point of impact. More often they are comminuted and puncture of the viscera occurs. Indirect violence—Fracture of convexity; muscular action during violent expiratory efforts; general paralysis of insane and age causing trophic changes (coughing may produce fracture here).

Displacements: Upward, outward; usually comminuted.

Complications: Injury to the thoracic contents causing emphysema. The posterior surface of the periosteum is usually intact. There are different varieties of emphysema when lung is adherent, interlobar and intercellular. If not adherent there may be pneumo-thorax with collapse of lung. Laceration of intercostal artery. Hernia of lung. Pleurisy and pneumonia (aged). Pleurisy will occur with any fracture of a rib. Heart or pericardial injuries.

Symptoms: Often obscure, especially in the green-stick variety, where we find localized pain and ecchymosis (examine by elevating arm). The pain should be localized, worse from motion and pressure, or when breathing. Cough reflex from irritation of intercostal nerve. Ecchymosis and pain at a distance. Abnormal mobility (hard to find). Crepitation. On auscultation, symptoms of localized pleurisy. Haemoptysis. Pneumonia. Pericarditis. Examine by pressure with one hand on back and one on sternum (Levis).

Prognosis: Good. Union in four weeks usually. Bad from complications (especially of heart). There is usually abundant callus or fibrinous union from mobility, or, if fracture is multiple, there may be a callus uniting several bones. Recovery is frequent even with complications.

Treatment: Reduction—If several broken this is hard. Immobilize the chest and fight inflammation and complications. Treat doubtful cases as fracture. If the fracture is angular outward, use direct pressure; if angular inward, press on sternum and have patient take a deep inspiration. In overriding, deep inspiration. Use hook and elevators if necessary. If comminuted, remove fragments. Immobilize by a broad bandage or adhesive strips (shave first) applied during expiration (straps over shoulder). These should never be applied below the ensiform cartilage. At times place the arm in a sling to immobilize. Cellular emphysema should be left alone. Pneumo-thorax, haemato-thorax, empyema: Aspirate in axillary line, between the sixth and seventh ribs, hugging the upper border of the rib; excision of a rib and a permanent drain may be employed. Treat pneumonia, pleurisy and pericarditis by the indicated remedy. Treat haemorrhage from intercostal artery by packing (drill hole, key, ligature, needle, bag of cotton). Treat hernia of lung as elsewhere.

Describe fractures of the costal cartilages.

These usually occur at point of juncture of rib and cartilage. Seventh and eighth are usually fractured. Usually occur in old people (partially ossified). They are usually transverse and usually uncomplicated.

Causes: Same as of rib fracture; direct violence most general.

Symptoms: Deformity most constant. Localized pain. Ecchymosis. Crepitus (moist if fracture of cartilage itself).

Diagnosis: Difficult. Acupuncture if in doubt, between bone and cartilage.

Prognosis: Union usually good. Union by osseous or fibro-osseous tissue from perichondrium.

Treatment: Treat all cases as fracture. Treat as ribs.

Describe fractures of the clavicle.

Points to be remembered: The coraco-clavicular ligament; insertion of deltoid and trapezius to outer third; insertion of sterno-cleido-mastoid to inner third.

Causes: Direct or indirect violence. Sometimes muscular action. Indirect violence most common, e. g., falls on hand, elbow, shoulder, etc. It is the bone most frequently broken, excepting the radius.

Location: Outer part of middle third because of small diameter, curve and indirect cause, also at outer end. Inner third usually by muscular action. Outer third: Trapezius and deltoid. Ligaments, coraco-clavicular, conoid (inner fasciculus and point of boundary). Middle third: Between conoid ligament (lower or outer part of first rib). Inner third: Between first rib and sternum (sterno-clavicular ligament). Attached to first rib by rhomboid ligament. Sterno-cleido-mastoid muscle above; pectoralis major below.

Varieties: Usually oblique (above, downward and inward as a rule). Comminuted, compound and multiple (great displacement) rare. Green stick common; hard to diagnose except by callus (late) or angular deformity and pain. Transverse: In young: periosteum untorn; if in adult, at outer third.

Complications: Injury to lung (with emphysema), to nerves, or to vessels. Very rare, but possible.

Symptoms: 1. Displacement: Inner fragment pulled upward by sterno-cleido-mastoid; outer fragment, inward, downward and forward,

due to (a) clavicle being stay of shoulder, (b) weight of shoulder. Action of serratus magnus and lesser pectoral pulling scapula and arm around to front produces shortening.

2. Crepitus: On reducing deformity.

3. Loss of function: Principally from pain; can't raise hand to erect head or abduct arm to right angle.

4. Deformity: Characteristic position; holding elbow, shoulder forward and downward.

5. Abnormal mobility; grasping bone and moving arm.

Diagnosis: Position of patient. Displacement. Loss of function.

Prognosis: Union quite firm in three weeks, complete in five to six weeks. Non-union rare. Exuberant callus frequently occurs; warn patient; it disappears in young children, not in adults. Osteophytes occasionally, underneath pressing on vessel and nerves.

Treatment: As deformity of a varying degree is the rule, and but little interference with function, green-stick fracture should be left alone.

Reduction: Raise shoulder upward, outward and backward, manipulating at the same time. Patient in chair, forcibly bring both shoulders back, lifting the one affected.

Retention: Dress four to six weeks, children three to four. Place in dorsal position with head a little raised with weight on shoulder for ten to fourteen days, with arm fastened across chest with elbows close to ribs. Then use dressings for about three weeks more.

Dressings: Posterior figure of eight, and sling of forearm and elbow. Mayor's handkerchief dressing used in green-stick fracture. Sayre. Adhevise plaster across back. Velpeau (?). Thomas. Axillary pads. Bryant, Morgan, Fox, Moore.

Describe fractures of the scapula.

Causes: Direct violence as a rule.

Prognosis: Union in from four to six weeks.

Location: Body most frequent; acromion next; coracoid process next; surgical neck and spine least frequent.

Fracture of the body: May be transverse or oblique; usually of infraspinous portion. Often comminuted. Inferior angle broken and usually a triangular piece of bone chipped off.

Symptoms: Crepitus. Pain. Some loss of function (arm cannot be brought in front of and across body). Ecchymosis usually late. If transverse, will feel projection and displacement, especially if axillary portion is involved. If multiple, may feel separate piece of bone.

Treatment: Reduction—As nearly as possible by moving arm in different directions. Place arm in position to approximate fragments (usually Velpeau). Retention—Apply bandage and adhesive plaster over fragments. Union in four to six weeks, with a little loss of function.

Fracture of acromion process:

Causes: Usually falling on arm. Even due to muscular violence because epiphysis unites late.

Diagnosis: Made by position of shoulder and arm. Force usually so great as to cause displacement, therefore, the shoulder is flattened and a sharp projection and sharp ridge can be felt by palpation. Loss of power of abduction.

Prognosis: Good. Union usually fibrous. Often confusion of diagnosis and may mistake for dislocation of shoulder.

Treatment: Reduction—Push humerus up against acromion and hold there. Retention—Use a figure of 8 bandage of axilla and shoulder; and a sling of the arm. Adhesive plaster may also be used.

Fracture of coracoid: As a rule, happens with other fractures and with dislocations. Rarely broken alone. It is hard to diagnose and

easily overlooked. It is due to direct violence and the symptoms are obscure. The displacement is not great.

Diagnosis: Crepitus. Sometimes abnormal mobility.

Treatment: Use a sling of the arm (Velpeau ideal). It should not interfere with the fighting of the local inflammation. Union in four weeks and usually fibrous (most always fibrous when the fragment is small).

Fracture of surgical neck: Rather rare, but important.

Causes: Due to direct or indirect violence by a fall on the elbow or hand.

Symptoms: Flat shoulder. Prominence of acromion. Arm hangs limp and somewhat lengthened. May feel movable body in axilla. Loss of function partial or complete, abnormal mobility in contra-distinction to dislocation. Displacement easily reduced by pushing up the humerus, but recurs by removing support of humerus. The head of the humerus can be felt to rotate in normal position; in dislocations not found here.

Treatment: Reduction—Raise arm and carry it across chest. Retention—Velpeau, Thomas bandage, with axillary pad often used (small pad). May use figure of 8 of the shoulder, axilla and elbow.

FRACTURES OF THE UPPER EXTREMITY.

What special points should be remembered in making an examination of the shoulder joint?

1. Ascertain whether the head is in place and moves with the shaft, or not.

2. Measure for shortening or lengthening and for the circumference of the joint.

3. That the plane of the external surface of the arm touches the external condyle, but not quite the acromion.

4. Notice whether the arm is limp or fixed.

How should inspection, palpation, mensuration and percussion be carried on?

Inspection:—Notice the contour of the shoulder, whether it is flattened and whether the acromion is absent or prominent. Note the position of the elbow.

Palpation:—Run the fingers along the clavicle, feel for the acromion, feel for the head of the humerus while moving the arm; examine the body of the scapula.

Mensuration:—Find the circumference and determine whether any swelling is due to contusion or dislocation. Find the length of the clavicle and of the arm.

Percussion:—This is mostly used for the clavicle. The percussion note is not transmitted in fracture.

What two points are used in measuring the length of the arm?

The posterior portion of the acromion and the internal epicondyle.

What are the divisions of the fractures of the humerus?

A. Those of the upper end. B. Shaft. C. Lower end.

Mention the fractures of the upper end of the humerus.

1. Head. 2. Anatomical neck and through the tuberosities. 3. Tuberosities. 4. Surgical neck or epiphyseal separation. 5. Fracture with dislocation, which may be either intro- or extra-capsular.

Give description, diagnosis and treatment of fractures of the head.

This rarely occurs alone, and is usually fissured and associated with other injuries, especially gunshot fracture.

The diagnosis is very difficult. There is deep pain, impaired function and obscure crepitus.

Treatment:—Use a sling of the hand to allow of extension by weight of the arm. Fasten the arm to the side and fight inflammation. Occasionally excision is necessary. Antiphlogistic treatment is important. Apply ice bag. If due to gunshot wound, treat the wound.

Give description, symptoms and treatment of fractures of the tuberosities.

These occur rarely, excepting with dislocation. The fracture is usually of the greater tuberosity.

Symptoms:—Cannot rotate the arm outward. Depression or sulcus.

Treatment:—External rotation, or axillary pad or triangle.

Describe fractures of the anatomical neck and through the tuberosities.

The former are exceedingly rare, there being very few recorded cases and these are doubtful ones. They are usually associated with fractures through the tuberosities and are found usually in old people. These fractures are usually comminuted and are often impacted, or the upper fragment is rotated or there is a loose fragment in the joint.

They usually unite without suppuration, but with osteophytes or exuberant callus and in an abnormal position from impaction or rotation or adhesions in the joint.

Symptoms:—Shortening (impaction), head does not move with the shaft. There is deep crepitus and pain and impaired function.

They may be intra- or extra-capsular and the intra-capsular may be impacted or comminuted.

Treatment:—Leave any impaction alone. Fight inflammation. Bandage the arm to the side and apply a sling of the hand.

What can be said of epiphyseal separation of the upper end of the humerus?

Ordinary union of the epiphysis with the shaft takes place between the twentieth and twenty-fifth year of life and separation is rare after the age of eighteen. The line of union runs below the head and tuberosities.

Separation may occur during parturition, or in children from falls or violent traction, or in youth from hard falls or violent wrenching.

Union is usually good and occasionally there is a diminution in growth. They occasionally resemble fracture of the surgical neck, the lower fragment being displaced forward.

Give the various important facts about fracture of the surgical neck.

These fractures are the most common and are found at all ages.

They are caused by direct or indirect violence.

Varieties:—Oblique, transverse, comminuted, impacted, fissured, gunshot.

The displacement is usually of the lower fragment inward, because the fracture takes place above the insertion of the pectoralis major, latissimus dorsi, the teres and coraco-brachialis muscles.

Symptoms:—The head is in position and does not move with the arm. The arm hangs limp and there is abnormal mobility, and the deformity recurs after reduction. The inner fragment can be felt, and there is crepitus and impaired function. In epiphyseal separation we have the age, moist crepitus and the smooth inner fragment to differentiate by.

Treatment:—Reduction is accomplished by traction and manipulation. Retention by an internal angular splint (not too high) and a shoulder-cap with weight or elastic traction. Middledorpf's triangle. If there is much inflammation, use a pillow and employ antiphlogistics.

Describe fracture without dislocation and give the symptoms and treatment.

This condition is rare. It may be intra- or extra-capsular. It usually results from great violence, or in the reduction of luxations, and occurs in middle and advanced life.

Symptoms:—The head is found out of place and there are the usual symptoms of fracture.

Treatment:—Reduction should be attempted, and if it fails, wait for union in the abnormal position, and then attempt reduction again. Formation of a false joint is liable to occur. As a last resort, the upper fragment may be excised.

Mention the varieties, causes and complications of fractures of the shaft of the humerus.

The shaft is liable to all varieties of fractures and displacements, depending on the direction of the force more than the muscular action. They are often multiple.

Causes:—Direct or indirect violence or muscular action. Spontaneous fracture is common. It may occur in childbirth or from falls or blows, or in playing baseball, etc. The shaft is sometimes fractured also when reducing dislocations.

Complications:—Injury to the nerves (musculo-spiral), non-union is common. They are apt to be associated with atrophy, making gaps.

Give the prognosis, symptoms and treatment of fractures of the shaft.

The prognosis is usually good, union occurring in six weeks, with a half inch of shortening.

Symptoms:—Subjective—Pain and loss of function. Objective—Deformity, shortening, limp limb, abnormal mobility (crepitus) and recurrence of the deformity.

Treatment:—Reduction. Flexion of the forearm, extension and counter-extension. Retention. Stromeyer's pad or pillow and antiphlogistics. Apply an internal angular splint and a shoulder cap extending to the elbow, and use a sling of the forearm. Extension may be made by a weight or an elastic cord, if necessary.

Mention the varieties of fracture of the lower end of the humerus.

They may be intra- or extra-capsular. 1. Transverse above the condyles or epiphyseal separation. 2. Condyles (oblique). 3. Epicondyles. 4. Intercondyloid, which may be a fissure or a T-shaped fracture. 5. Comminuted, usually a gunshot fracture.

What are the principal points to be remembered in the diagnosis of injuries to the elbow?

1. The head of the radius. 2. The intercondyloid test line. 3. The measurement of the arm and forearm. 4. The circumference of the joint. 5. The swelling comes on rapidly.

Describe a transverse fracture of the humerus above the condyles.

This is the supra-condyloid fracture and is common. It is similar to epiphyseal separation, which results in a diminution in the growth. The direction of the fracture is from below, upward and backward. The displacement is of the lower fragment upward and backward, with the upper fragment in front of the joint.

Symptoms:—Sharp projection behind the joint, but the test line and the head of the radius are found all right. There is no shortenig of the forearm, but the arm is shortened. There is abnormal mobility and recurrence of the deformity after reduction. Epiphyseal separation has the same symptoms, but the age of the patient influences the diagnosis in that variety.

Treatment:—Reduction. Mould the fragments into position with the arm in the extended position or one slightly flexed. The extended position is often necessary to perfect adjustment.

Retention. Apply an anterior acute-angle splint and later an internal angular splint.

Describe fracture of the condyles of the humerus.

The internal condyle is usually fractured. The line of fracture usually runs obliquely from the centre of the trochlea, upward and inward, or outward to above the internal or external epicondyle.

Symptoms:—Rapid swelling, deep crepitus, mobility occasionally, straightening or outward bending of the forearm, and partial luxations of the radius or ulna.

Prognosis:—Union occurs in from four to five weeks. There is often stiffness and a loss of the carrying function, which gives the gunstock deformity.

Treatment:—Reduction is made by traction and bending the arm in or out. Retention is accomplished by placing the arm in the extended position and applying a splint or a plaster trough cut out to fit the arm. Later it is placed in the flexed position.

What can be said about fractures of the epicondyles?

The internal epicondyle is the one usually affected. There is mobility or an absence of the tip. The treatment consists in a replacement by manipulation, and the fractured part is retained in position by a well-padded, internal angular splint. Remember the relation of the ulnar nerve to the epicondyle.

Describe inter-condyloid fracture of the humerus.

This usually results in a stiff joint. There is a broadening of the joint, with swelling and pain, etc. The test marks are normal.

Treatment:—Fight the inflammation. Place the arm in the best position for a stiff joint.

In the T-fracture there is broadening and symptoms of a transverse fracture.

General treatment for fractures of the lower end of the humerus:—Watch the finger nails and fingers. Look out for swelling, numbness or coldness. Fight inflammation for a week. Begin passive motion early (7—10 days). Do not keep the splints on too long (three or four weeks). Encourage use of the part. Give them weights, the sand bucket and exercise.

What are the fractures of the bones of the forearm near the elbow?

Fractures of the coronoid process, head and neck of the radius, and of the olecranon.

Describe fracture of the coronoid process and give the symptoms and treatment.

This fracture is rare, excepting with the dislocation backward of both bones.

Symptoms:—Dislocation and small body in the line of the brachialis anticus. Remember that muscular action cannot fracture, as the insertion is to the base of the process.

Treatment:—Apply an anterior acute angle splint or a plaster of Paris bandage for two weeks, or flex the forearm and bandage.

Describe fracture of the head and neck of the radius.

This is very rare. Subluxation in children is more common. There may be a stellate fracture of the head from the same causes as Colles' fracture. There may be a splitting off of the head or a fracture of the neck above the tubercle.

Treatment:—Flex, supinate and immobilize with an anterior angular splint.

How is fracture of the olecranon usually caused? Give the varieties, symptoms, prognosis and treatment.

The cause is usually leverage (not muscular action) or direct violence.

Varieties:—Diastasis (epiphysis unites about the sixteenth year), fracture in the tendinous expansion, fracture with displacement.

Symptoms:—Pain, swelling, mobility (lateral), loss of extension, depression between the fragments. Displacement often comes late.

Prognosis:—Good union in eight weeks. It is occasionally bony, though usually fibrous, and non-union is also occasional. Ankylosis is rare, though the joint may be opened. Callus, causing stiffness, may result. Impaired extension is less troublesome than impaired flexion.

Treatment:—Moderate extension such as may be obtained by the arm hanging passively at the side. Beware of over-extension. Apply an anterior splint or a plaster of Paris trough, using adhesive plaster to drag down the upper fragment. If there is little or no tendency to displacement, flexion or a half flexed position may be used. Steel hooks may be employed after the inflammation has subsided. Aspiration is in order if synovial effusion causes displacement. If ankylosis is feared, use careful passive motion after three weeks. If very bad function results, the fragments should be wired together.

What are the causes, varieties and displacements of fractures of the shafts of both ulna and radius?

The cause is usually direct violence. It rarely results from muscular action.

Varieties:—Greenstick common. The radius is usually fractured above the ulna.

Displacements:—Overriding and shortening (even 2 or 3 inches), inward approximation of both bones (due to the pronator quadratus muscle). If the fracture is above the pronator radii teres (i. e., about the middle), the supinator brevis and the biceps supinate the upper fragment and produce rotary displacement.

What are the symptoms, prognosis and treatment for fracture of the shaft of the ulna and radius?

Symptoms:—The head of the radius does not rotate. There is pain, loss of function, abnormal mobility, crepitus, deformity and shortening.

Prognosis:—Union occurs in about four weeks. We may have impaired pronation and supination from exuberant callus and inward displacement, or delayed or non-union. Look out for gangrene from a tight bandage. Direct injury will probably predispose to gangrene. The radius unites more slowly than the ulna. Gangrene is induced by the firm wall, i. e., two bones and the interosseous ligament.

Treatment:—Reduction. By extension, counter-extension and manipulation by the pressure of the finger between the bones. Retention. Place the forearm in the supine or semi-supine position, as this gives the most comfort and the widest interspace. Apply an anterior or a posterior right angle splint with extension, or a posterior trough with flexor and extensor splints may be used. A plaster of Paris bandage may be used. Suspend the arm with a broad sling. Use no interosseous pad and examine daily for a week.

Describe fracture of the shaft of the ulna.

It is usually caused by direct violence and is often complicated with dislocation of the radius.

Symptoms:—The bone being subcutaneous, any break in its contin-

uity may be felt. The percussion note is not transmitted from one end to the other. There is no shortening unless the radius is dislocated.

Treatment:—Reduce and retain as above for three weeks in the semi-supine position. Retention should be made by splints or a plaster of Paris bandage.

What are the symptoms, treatment and prognosis of fracture of the shaft of the radius?

Symptoms:—The head of the radius does not rotate. The bone being deeply situated, palpation and manipulation are used to find abnormal mobility. Pain and crepitus are also common symptoms.

Treatment:—This should be the same as for both bones. Place in supine position if the fracture is above the middle. The hand may be displaced to the radial side and require extension.

Prognosis:—There is danger, as in fracture of both bones, of interference with pronation and supination.

What is Colles' fracture?

It is a fracture occurring at a point one-half to three-fourths of an inch above the lower end of the radius at the junction of the cancellous expansion with the shaft. It is usually produced by falls on the outstreched hand, and is usually complete. It is often impacted and occasionally fissured (Barton's) or comminuted.

Give the diagnosis, prognosis, symptoms and treatment of Colles' fracture.

It is usually mistaken for a sprain, and, when there is any doubt, it should be treated as a fracture. Dislocation of the wrist is very rare. Epiphyseal separation (occurring between the ages of fifteen and twenty) is rare. It results in a diminution in the growth, and should be treated the same as fracture.

Prognosis:—The fracture always unites. The dangers are: 1. Incomplete reduction. 2. Stiff tendons from inflammation of the sheaths (leave the fingers free). 3. Subsequent partial luxations to the ulnar side from laceration of the radio-ulnar ligaments and of the lateral ligaments. This may occur late or at the time of injury. 4. Rheumatic and neuralgic pains.

Symptoms:—"Silver fork" deformity. The lower fragment is found on the dorsum and the upper fragment in the palm. The hand is drawn to the radial side, the tendons are tense; the styloid processes are displaced, and there are symptoms of impaction.

Treatment:—Reduction. 1. Set and dress early, or you will fail to reduce. 2. Use ether and make reduction complete. 3. Break up the impaction always.

Flex the forearm to relax the muscles. Reduce by traction and manipulation, holding the patient's hand with one hand and manipulating with the fingers and thumb of the other hand. Abduct the hand to ulnar side.

Retention:—Levis or Bond splints. Place in bed for two or three weeks (intelligent patients ten days). Take off the splints in four weeks and encourage use of hand. Avoid constricting and allow the use of the fingers. This is more important and usually dispenses with passive motion.

Give the symptoms and treatment of fractures of the styloid processes.

There may be a chipping off of the styloid processes. Diagnosis by palpation is easy. They are treated by manipulation and are held in place by adhesive plaster.

What are the causes, symptoms and treatment of fractures of the carpal bones?

They are rare and are caused by a crushing force which makes a comminuted fracture. There is crepitus and deformity. Fight the inflammation.

Describe and give the causes and treatment of fractures of the metacarpal bones.

These do not include fracture of the metacarpal bone of the thumb.

Causes:—Direct violence usually, occasionally indirect violence, i. e., blows.

Symptoms:—Localized pain and deformity.

Treatment:—Reduction is made by manipulation, extension and counter-extension. Retention is by a ball in the palm of the hand and the application of an outer and an inner moulded splint, or a plaster of Paris splint.

Union occurs in three or four weeks.

Describe fractures of the phalanges.

These include fracture of the metacarpus of the thumb. They are caused usually by direct violence and are often compound and comminuted.

Symptoms:—Swelling often disguises the condition and mobility and crepitus alone are diagnostic.

Treatment:—Amputation may be necessary; however, be conservative. A digital trough of gutta percha or tin should be applied and the other fingers may be used as splints to hold the fractured finger straight and to prevent lateral deformity.

FRACTURE OF THE LOWER EXTREMITY.

Mention the varieties of fractures of the pelvis.

They are rare and usually multiple. 1. Vertical fracture of the rami, especially those of the pubes. 2. Driving of the head of the femur through the acetabulum, or producing a radiating fracture from the acetabulum. 3. Transverse fractures of the sacrum or coccyx. 4. Separation of the pubic or sacro-iliac synchondroses, especially in the young (primary centres unite about the fifteenth year, the secondary centres about the twenty-fifth year). Occasionally, in the double vertical fracture, there is an upward displacement of one side.

Give the causes, complications and prognosis of fractures of the pelvis.

They are usually caused by great violence, such as being run over by carriages or cars; and from falling embankments. They may occur during parturition, or from forced abduction of the thigh.

Dignosis:—The finger can be run over the sacrum, the crests of the ilia and the pubes. Vaginal and rectal examinations are important. and may be used as a means of reduction.

Complications:—Laceration of the urethra (membranous), rupture of the bladder, colon, rectum or iliac vessels; injuries to the solid organs, uterus, etc.; secondary suppuration of the connective tissue, necrosis, peritonitis, etc.

Prognosis:—They usually unite in six to eight weeks. They are dangerous according to the severity of the injury. Death may result from complications. In the female they may interfere with future confinements. Without complications, even severe fractures unite. Lameness is common from injuries to the muscles, or from cicatricial tissue, callus or deformity.

Describe the symptoms and treatment of fractures of the pelvis.

The symptoms are:—1. Deformity is usually slight unless the crest of the ilium is fractured. 2. Crepitus occasionally. 3. Abnormal mobility (usually subjective). 4. Extravasation (late). 5. Bloody urine or retention. 6. Hemorrhage from the rectum. 7. Peritonitis. 8. Pelvic cellulitis. 9. Paralysis of the rectum, bladder or legs (sacrum). 10. Fracture of the rim of the acetabulum with dislocation, to be distinguished from dislocation and fracture of the neck of the femur.

Treatment:—Catheterize, tying the catheter in, or perform perineal section. Avoid violent manipulation. If possible, reduce carefully through the rectum or vagina. Retention is accomplished by encircling the pelvis with a linen or adhesive plaster band, or a plaster of Paris or flannel bandage. Place a pad in the rectum, apply extension to the limbs, order rest in bed in a comfortable position. Look to the drainage of any pus. Abdominal section will be necessary for bladder or bowel ruptures. Acetabulur fracture calls for immobilization of the hip-joint.

What can be said of fracture of the coccyx and coccygodynia?

The coccyx is usually fractured by falls or during parturition. It may be replaced from inside the rectum.

Coccygodynea gives the symptom of anal fissure and can be treated by a subcutaneous division of the soft parts and a removal of the bone (difficult).

How are fractures of the femur divided?

Into fractures of the upper and lower ends and the shaft.

Name some surgical point about the fractures of the upper end of the femur.

Nelaton's test line and Bryant's triangle; Allis test; normal difference in measurement one-half to three-fourths of an inch; the arc of rotation.

Describe Nelaton's test line, Bryant's triangle and the Allis test, and tell for what they are used.

Nelaton's test line runs from the anterior superior spine of the ilium to the most prominent point on the tuberosity of the ischium. If the trochanter is displaced upward, it will ride over this line; otherwise it is scarcely touched by this line.

Bryant's triangle:—Drop a vertical line from the anterior superior spine of the ilium to the table and measure from this line to the trochanter and compare with the same measurement on the well side.

The Allis test is used to find the comparative resistance of the fascia lata. When fracture is present, the finger can be pressed into the fascia lata. This test is not very useful.

What are the fractures of the upper end of the femur?

Epiphyseal separation. This is very rare, occurring under the age of eighteen, and is really a fracture of the neck.

Trochanter major. This is rare and may be produced by muscular action in the young, or by a direct blow in older people. It is easily diagnosed, being subcutaneous. There is early ecchymosis, and by manipulation the loose fragment can be found. The fragment should be moulded into place and retained by a pad, binder or adhesive strips. Fibrous union results as a rule, and the functional result is good.

Fracture through the trochanter and neck (extra-capsular).

Fracture through the great trochanter and below the lesser (fracture of the upper third).

Describe a fracture of the trochanter and the neck.

This is intra-capsular and usually intra-articular. It occurs most

frequently in old females. The broad pelvis causes the neck to assume a position at right angles to the shaft.

Causes:—Slight indirect violence. Porosity and brittleness of the bone in the aged.

Character:—It is usually incomplete, but sometimes complete. It may be impacted, the neck being driven into the head (rare). The fracture is usually partial. The posterior portion breaks first.

Prognosis:—This depends absolutely on the presence or absence of a partial fracture. In patients over sixty, if the fracture be complete, the prognosis is bad, non-union resulting as a rule. If incomplete, union may take place at any time. Failure in treatment occurs from the

Complications:—Patients are apt to die from the confinement necessary for treatment. Bedsores result or gangrene of the toes or hypostatic pneumonia. Osteophytes and products of rheumatic arthritis may result, or a false joint with hypertrophied ligaments (Y) and connective tissue, and ebonation of the ends of the fragments. Greater or lesser disability from shortening, and eversion and impaired function.

Symptoms:—The patient may tell of tripping over a rug on the floor or some such accident. There is: 1. Loss of function though the patient may walk a little (great danger in this). 2. Pain in the thigh, groin, knee or deep in the hip. 3. Muscular spasm. 4. Deformity (a) eversion (cannot invert), rarely inversion, (b) flattened hip and shortened arc of rotation, (c) shortening (of limb with the trochanter high) comes on late from laceration or relaxation of the capsule, or from breaking up the inpaction, or from completion of the fracture, (d) crepitus rare.

Treatment:—Unless shortening is present (i. e., complete fracture), treat at once. If the fracture is incomplete, place in bed, steady the limb with sand bags, overcome muscular action to prevent a completion of the fracture. Reduction should not be attempted in complete fracture. Retention may be accomplished by placing a pad under the trochanter, applying a pelvic band or Senn's dressing. Buck's extension using a light weight, unless there is spasm from shortening. Apply sand bags. Raise the foot of the bed. A pad under the knee prevents hyperextension. Watch for bedsores. In incomplete fracture, the patient may be kept in bed for six weeks, and then allowed the use of the rolling chair, and, after a few weeks more, can walk with crutches. Use a frame to keep the bed clothes from the foot. Keep the toes pointing straight upward. If the patient is failing, get him up. The Thomas splint, the Listen long splint, or the Sayre apparatus may be used.

Describe extra-capsular fractures of the upper end of the femur.

These are fractures of adult life and result from direct violence to the hip, and are usually impacted. Direct and great violence may cause it in the young. These fractures may be impacted or complete. The prognosis in impacted fracture is excellent; in complete, not so good as there is interference with function and shortening.

Give the symptoms and treatment of impacted extra-capsular fracture.

There may be some function, some eversion with fixation, some shortening, a diminished arc of rotation, no crepitus (do not try to get it) flattening. It should be distinguished from intra-capsular fracture, dislocation and contusion.

The treatment is the same as for intra-capsular fracture, but no extension should be applied. Allow a slight shortening and inversion.

Give the symptoms and treatment of complete extra-capsular fracture.

There is marked shortening (early), crepitus and eversion, with shortening of the arc of rotation.

Prognosis is good, union resulting in eight weeks. Osteophytes and rheumatic pains may result.

Treatment:—Should be the same as for intra-capsular fracture.

What are the locations and varieties of fractures of the shaft of the femur?

They may occur at any point between the trochanters and the condyles. They are transverse in children. In adults they are oblique, and there is marked deformity, i. e., shortening, rotary, angular or longitudinal displacement. The fracture occurring at the junction of the middle and upper third is important.

What is the prognosis for fractures of the shaft of the femur?

Union occurs in eight weeks and the patient may bear the weight in twelve weeks and the full weight after six months, because the callus yields late (third or fourth month). Shortening is the rule. It may be considered a good result if it is less than one inch. Non-union is common. The knee is usually stiff, but requires no special treatment. It is better not to break up actively. The prognosis is apt to be serious in rheumatic patients, and compound fracture is serious, excepting with strictest antisepsis.

What are the symptoms and treatment for fracture of the shaft of the femur?

Diagnosis is easy. There is loss of function, abnormal mobility; the trochanter does not rotate, there is crepitus, deformity of the thigh and shortening.

Treatment:—Reduction is accomplished by extension, counter extension and manipulation under ether. Retention—Select a bed that does not sag. Raise the foot of the bed at least four inches, keep the head low and the patient flat on his back. Apply an adhesive plaster extension, with fifteen pounds or more of weight attached, until the muscle tires, and then use less. The patient may be propped up in bed in three or four weeks. From now on, if there is a tendency for the leg to rotate outward, apply the Listen long splint with a cross-piece at the foot to prevent the eversion and to steady the foot and keep the limb straight. Short coaptation splints may be used with straps and buckles. Don't let the weights or heel catch. Pad the popliteal space and the heel, and use a frame for the bed clothes. Remove the dressings and examine in six weeks. If all is satisfactory, apply plaster of Paris cast to the groin. Keep in bed two weeks, then sitting up two weeks and then two weeks on crutches; then use a split cast or light splints, and allow to use a cane. The fracture is not well nor the danger over until six months have passed.

For fracture of the upper third, a double incline plane or a box with extension should be used; or a Nathan Smith anterior wire splint may be applied and the limb swung.

In children, union occurs in from four to six weeks. Use the Hamilton double splint, vertical extension. In infants use the coaptation splints (anterior and posterior) and flexion on the abdomen and a bandage.

Describe fractures of the lower end of the femur.

They resemble those of the humerus. Remember that here is the largest joint of the body, which may be involved. The fracture may be T-shaped or longitudinal (hard to distinguish). In longitudinal fract-

ure, fight the inflammation. One of the condyles may be fractured and displaced upward. The bone may break in some lines and no displacement follow. This is known as "sprain fracture of the knee." It often occurs in foot ball. It should be treated accurately or deformity and interference with the joint may occur.

Symptoms:—There is loss of function, pain and rapid effusion, crepitus, mobility and deformity.

Complications:—There may be pressure on the popliteal vessels, producing gangrene.

The lower fragment may be pulled backward by the two heads of the gastrocnemius and the vessels ruptured, or an abscess in the popliteal space may be caused. Haemorrhage, effusion, inflammation or a fragment in the joint may cause ankylosis or a suppurative arthritis.

Prognosis:—This may be grave from the complications. There is danger of stiff knee. Union occurs in six to eight weeks.

Treatment:—Traction in the extended position or flexion if necessary for coaptation (supra-condyloid fracture), using the double incline plane. Aspiration. Tenotomy of the tendo Achilles. Treatment for joint suppuration. Place the limb in the best position for stiff knee.

What can be said of fractures of the condyles of the femur?

They are often mistaken for sprains. There is but little displacement. They are recognized by pain, imperfect function, independent mobility and crepitus. Fracture of the internal condyle may cause adduction of the leg.

What are the causes and varieties of fractures of the patella?

They are usually caused by muscular action (transverse) or by direct violence (stellate or comminuted).

Varieties:—The fracture is usually transverse below the middle, with the lower fragment broken in two; or it may be a stellate, a comminuted or a compound fracture. There may be a fracture of both patellae.

Give the symptoms, prognosis and treatment of fracture of the patella.

The symptoms are history, loss of function (extension of leg), depression, effusion and a displacement of the upper fragment.

Prognosis:—Fibrous union with a separation of about one inch. This may stretch or refracture. The patient cannot bend the limb for a full year, and there is stiffness for from six to twelve months. Compound fractures are serious.

Treatment:—Fight inflammation, aspirate, use ice bag and extension of the leg and flexion of the thigh. Place the patient in bed and elevate the limb. Draw the fragments together with adhesive strips. This can usually be accomplished in two weeks, and then a plaster cast should be applied and split, and every two or three days the fragments should be held together and a massage given the muscle or Farradic treatment to prevent atrophy. This is very important. After six weeks (including two weeks with ice bag) of this treatment, the patient may go on crutches for six weeks with a cast. At the end of this time, apply a posterior splint and allow a cane. Allow complete flexion at the end of the year.

Mention the complications of fracture of the patella and their treatment.

There may be a refracture; if so, cut down and wire the two fragments together after removing the fibrous tissue. Even with a large amount of fibrous tissue there may still be good motion and the vasti

may compensate. A silk suture may be placed around the bone and be left in.

Mention the surgical points about fractures of the tibia and fibula.

The crest of the tibia is subcutaneous. Fracture of the fibula can be diagnosed by pressure or percussion. Shortening may be found by seating the patient in a chair with the feet on the floor and the legs bared and comparing the height of the knees.

What are the varieties of fractures of the tibia and fibula?

Those of the tibia are more or less transverse, or they may invade the knee-joint or be oblique or T-shaped, and they may be associated with fracture or dislocation of the fibula. The fibula is very rarely broken alone. Occasionally there is diastasis (interfering with the growth of the bone). There also may be pathological fractures.

What are the complications, symptoms and treatment of fractures near the knee of both bones of the leg?

Complications:—Synovial inflammation and suppuration; ankylosis; injury to the popliteal vessels and nerves. In fracture of the fibula the external popliteal nerve may be injured, resulting in a paralysis of the muscles supplied by it.

The symptoms are the usual ones of fracture.

The loss of function is deceiving and may not be entirely lost at once. It is harder to make out a coincident fracture of the fibula. Press the fragments down and thus avoid making a compound fracture.

Treatment:—The knee should be fixed and the long box or double incline plane used. Fight and treat the inflammation. If the fibula is broken, it may be necessary to flex the leg to relax the biceps (The fibula is occasionally broken by the muscular action of the biceps). After ten days examine and put the limb up in a plaster cast, going above the knee, and allow the patient to go home. The cast can be left on for six months, with occasional examination, and the patient can use crutches after eight weeks.

Prognosis:—The tibia is subject to non-union. There is a yielding of the callus. They are apt to be compound and the inflammatory tissue around the muscle may interfere with the return circulation, and this results in oedema and rheumatoid pains.

Describe fractures of the shafts of both bones of the leg.

The tibia is rarely broken alone, except by direct violence to it. The fibula is more often broken alone, and it is also broken higher up. The location of fractures of the shafts is usually at the junction of the lower and middle thirds. They are often compound, the tibia being subcutaneous. The fractures may be transverse, V-shaped, comminuted, but usually oblique. The upper fragment is usually displaced forward, and the lower backward and upward.

Symptoms:—There is abnormal mobility (both bones especially), shortening, crepitus. The fracture can be felt along the crest of the tibia and fracture of the fibula is found by percussion. Occasionally the patient can walk.

Prognosis:—Good, if there are no complications.

Complications:—Blebs, swelling and cellulitis, fat embolism and non-union. Sequellae:—Neuralgic or rheumatoid pains, oedema, stiff ankle, ulcers from imperfect circulation. Occasionally a giving away of the callus.

Treatment:—Reduction and retention. Boyer dressing. Fracture box with extension by a Barton's knot. Ring to the heel. Use no primary bandage and avoid the pressing of the foot on the bottom of the box. The ball of the big toe, the inner malleolus and the internal condyle should be in a straight line. Muscular spasm can be overcome by posi-

tion, tenotomy or pressure of the femoral artery. Avoid backward displacement by padding or adhesive plaster. Examine daily. In two or three weeks the limb may be placed in a plaster cast, and, if the fracture is compound, a window may be cut in the cast. This insures good drainage and antisepsis. After six or eight weeks the patient may use crutches, being careful not to bear too much weight on the leg. Keep the foot at a right angle.

Describe fractures of the leg bones near the ankle.

These are often serious injuries, and they may be comminuted and even involve the joint. There may be a laceration of the ligaments. Both bones are usually broken, and there may be a driving up of the astragalus or a chipping off of the malleolus, resulting in a "sprain fracture." This latter is easily overlooked.

Prognosis:—Union occurs in about five weeks. A stiff joint is common. Weak lax ligaments may result. The best position for a stiff foot is at a right angle. Compound fractures here are very serious.

Treatment:—Use a fracture box. Inversion and eversion can be overcome by compresses. Later a carefully adjusted plaster cast may be applied.

What is a Pott's fracture?

It is a fracture about one to three inches above the malleolus of the fibula. It comprises a fracture of the fibula at the point above mentioned; a fracture or a chipping off of the internal malleolus, or a laceration of the internal lateral ligament, and a fracture of the outer side of the end of the tibia, or a laceration of the tibio-fibular ligament. The displacement is outward and the foot is dislocated backward.

Give the causes, symptoms and treatment of Pott's fracture.

It is caused by forcible eversion and abduction. Rarely by the opposite.

Symptoms:—Deformity, the foot being displaced outward and backward and the internal malleolus being prominent. Localized pain at the three points of injury. Loss of function (inconstant). Widened tibio-fibular mortice. The tip of the malleolus may slough through early or late.

Treatment:—Reduction. Grasp the leg with one hand and the sole of the foot in the other. Draw the foot forward and then invert until the astragalus rests against the internal malleolus. Manipulate later. Retention:—Plaster of Paris splints extending from the dorsum around under the sole and up the inside of the leg. Also a posterior plaster of Paris splint from the knee to beyond the toes, or Dupuytren's splint, watching out for the pressure of the pad.

What can be said of fractures of the bones of the foot?

They are usually due to severe injuries, from direct violence, such as a crushing force. They are often comminuted, often compound, and often require excision or amputation, or free incision and drainage. The astragalus is often comminuted and the fragments may require removal. If not compound, these fractures heal rapidly.

Describe fractures of the tarsus.

They usually result from a crushing force. The diagnosis may be made by manipulation or by shaking the foot.

Treatment:—Reduce the deformity by manipulation and mold the fragments in place. If the fragments will not live, remove them. Fight the inflammation and immobilize.

Describe fractures of the metatarsus.

They are usually of the big and little toes. They should be thor-

oughly reduced and immobilized. Apply plaster of Paris dorsal and plantar splints.

What can be said of fractures of the os calcis?

They are rare and are produced by falling on the heel. The foot should be placed in the equinus position and immobilized.

How are fractures of the phalynges treated?

Amputation is often necessary. The fractured toe may be fastened to the others with adhesive plaster. Fight serious inflammation.

DISLOCATIONS OR LUXATIONS.

Define dislocation or luxation. Define sprain.

A dislocation is a displacement from each other of the articular portions of the bones entering into the formation of a joint, which displacement is permanent and abnormal. A sprain is a momentary dislocation.

Describe dislocations and give the varieties.

Displacements may be backward, forward, upward, downward or lateral. Luxations are also named from the distal bone involved.

The varieties are traumatic, pathological, congenital, ancient, recent, complete and incomplete or subluxations. They may also be primary, secondary, compound, simple, complicated, single, double (jaw) or multiple.

How are the causes of dislocations divided?

Into predisposing and exciting.

Mention the predisposing causes of dislocations.

Lax ligaments, weak muscles, capsular tears, imperfect socket, greater freedom in certain joints, certain positions at time of injury.

Mention the exciting causes of dislocations.

External violence:—Direct, indirect, twists.

Internal violence:—Muscular action.

The strength and arrangement of the ligaments determine the direction of the dislocation and whether a dislocation or a fracture will occur. Muscles undoubtedly aid in the production of a dislocation, for a man when drunk will seldom sustain a dislocation. Muscular action may produce dislocation suddenly by voluntary motions or convulsions. Muscular action is important in secondary and recurring luxations. Voluntary muscular action with loose ligaments may produce dislocations at will.

Give the pathology of dislocations.

In incomplete luxations there is nothing more than a stretching of the ligaments. In complete, ligaments, tendons and muscles may be torn from their attachments. There is often injury to the soft parts (vessels, nerves, etc.).

Why are compound dislocations important?

If they are reduced early and properly retained they often return to the normal, whereas, there may be inflammation, adhesions and even pus.

If unreducible, the capsule fills up with granulation tissue and the head of the bone will cause a productive inflammation which will form a new socket.

Mention the symptoms of dislocations.

There are three subjective and three objective symptoms. The subjective are history, pain and loss of function; and the objective, abnormal immobility, deformity and no recurrence after reduction. The pain is benumbing and dull, the deformity consists in the length, the presence of a rounded body, very marked localized swelling, displacement in the axis and difference in the circumference of the joint and abnormal depression and prominence. With the abnormal immobility there is the absence of crepitus (moist).

What is the prognosis of dislocations?

Bad results may follow in simple cases. It depends on the complications, the joint involved and early reduction. There may be pain and stiffness, worse in bad weather, and muscular weakness and atrophy may result. Recurrences may follow. Rupture of the main artery is bad. Torn ligaments, nerves, muscles and tendons may require an operation. Ancient dislocations may give good results in function, especially in a bone.

Reduction is often dangerous, especially at the shoulder.

Give the treatment for dislocations.

Spontaneous reduction may result (partial dislocations of the shoulder). The time for reduction is the present. Be gentle and use intelligence (great force is rarely necessary in recent cases).

The difficulties accompanying reduction are: 1. Muscular spasm. 2. Inability to find the rent. 3. Intervening muscle, tendons or a flap of the capsule. Relaxation by diverting the patient's attention will aid in overcoming muscular spasm. The first stage of ether is usually sufficient for reduction. The parts should be manipulated to find the rent in the capsule. Reverse the route of exit in the direction of least resistance. Extension, counter-extension and manipulation in the direction of the deformity. Intervening muscles, tendons and flaps of the capsule may require an operation. Retention is accomplished by splints and bandages. Function may be restored by passive motion, massage, douches and electricity. In ancient dislocations, soften by passive motion, massage, extension and a poultice. Divide any bands that may have formed. Break up any adhesions under ether. Apply extension, counter-extension and manipulation.

SPECIAL DISLOCATIONS.

Describe dislocations of the jaw.

They comprise about 4 per cent. of all dislocations and occur between the ages of twenty and thirty.

Varieties:—Partial, forward, unilateral, bilateral or double, and backward with fracture of the external auditory canal.

Causes:—They occur most frequently in women. The predisposing causes are a shallow fossa and lax articular ligaments. The exciting causes are a wide opening of the mouth, blows on the chin with the mouth open, extraction of teeth, and scolding.

Mechanism:—The internal pterygoid muscle acts as a fulcrum, the muscles of the chin act as the long lever and, aided by the external pterygoid, pull the jaw forward, and the masseter and temporal muscles draw the jaw up. The capsule is usually torn.

Symptoms:—The jaw is open and fixed, vacant expression, depression in front of the ear, condyles found in front and occasionally the coronoid process.

Treatment:—When the dislocation is only partial, it is sufficient to simply press the jaw up. If the complete, pad the thumbs, introduce them into the mouth and depress the chin first to disengage the coronoid process and then elevate. Reduce one side at a time and avoid reluxation. In ancient dislocations, make forcible movements, open the mouth wider (Stromeyer forceps) and shut it. If this fails, resect or excise the condyles. After treatment:—Apply a Barton bandage for a week.

The conditions simulating luxations of the lower jaw are spasms of the genio- and mylo-hyoid muscles and subluxations.

DISLOCATIONS OF THE RIBS AND STERNUM.

Give the causes, diagnosis and treatment of dislocations of the ribs.

They are usually due to some terrific force, and hence are sometimes fatal.

They are diagnosed by finding a depression where the head of the rib should be.

They are treated by a broad band (adhesive plaster) around the body).

Describe dislocations of the sternum.

They are of the manubrium and the ensiform cartilage, and are rare. They result from severe force, and 50 per cent. are fatal. The force is usually crushing and direct.

Reduction is usually impossible except by bending the chest backward on a block. If the patient survives, he is usually not incommoded by the deformity.

DISLOCATIONS OF THE UPPER EXTREMITY.

Describe dislocations of the clavicle, giving varieties, causes and symptoms.

They are usually of the inner end and comprise 3.1 per cent. of all dislocations.

Varieties:—Forward, backward, upward, and complete or incomplete.

Causes:—Exaggerated movements at the shoulder, indirect force. Occasionally it results gradually by a stretching of the ligaments.

Symptoms:—Local pain, head of the clavicle in an abnormal position. In backward dislocation, there may be dyspnoea and dysphagia, which disappear, however, even if unreduced.

Describe the treatment of dislocations of the clavicle.

They are easily reduced by carrying the shoulder outward and upward, or upward and forward or backward, according to the luxation. The head can then be pushed into the socket. Retention is more difficult and it may be necessary to wire the parts in place. If the head produces dangerous symptoms, it may have to be excised. Apply a Velpeau and pads for four weeks and order rest in bed in the fracture position.

Give the varieties, symptoms and treatment of dislocations of the scapula.

Varieties:—Sub, supra and post-clavicular, and complete and incomplete (rupture of the joint and its ligaments and of the conoid and trapezoid ligaments). The post-clavicular are very rare.

Symptoms:—The end of the clavicle is prominent above and the acromion below the shoulder. Inward rotation of the inferior angle of the scapula, and pain, causing a loss of function.

Treatment:—The subclavicular variety should be reduced by pushing the shoulder upward, outward and backward and by applying local pressure and fastening the arm at the side, using a Velpeau or adhesive plaster. Place the patient in bed in the dorsal position. The supra-clavicular are reduced in an opposite manner.

Describe dislocations of the humerus, giving the varieties.

These are the most common because of the shallowness of the joint. They occur usually in middle life. The varieties are: 1. Downward and inward (subglenoid or axillary). 2. Forward, two forms, subcoracoid and subclavicular. 3. Backward and inward or subspinous.

They are usually caused by indirect violence, rarely by direct.

Give the pathology of the downward dislocations.

There is a tear in the under side of the capsule and the head comes out on the anterior surface of the scapula, below and to the inner side of the glenoid fossa. It is held here by the triceps and the subscapularis muscles. The axillary contents are compressed and possibly the circumflex nerve, causing a paralysis of the deltoid muscle. The deltoid, spinati and coraco-brachialis muscles are made tense and may be torn. The long head of the biceps may be dislocated.

Give the pathology of forward, or subcoracoid dislocations.

The anterior portion of the ligament is torn and the head is found in front of the scapular neck and below the coracoid. It may be secondary to the subglenoid variety from muscular action or manipulation.

Describe subclavicular and subspinous dislocations.

In the subclavicular variety, the head is found under the pectoral muscles and below the clavicle.

The subspinous variety is very rare. The head of the humerus is thrown inward upon the dorsum of the scapula below the spine.

Give the symptoms of dislocations of the shoulder joint.

The shoulder is flat, the acromion is prominent, the elbow abducted and the axis of the humerus abnormal. The head is in an abnormal position. There is pain and numbness, especially in the axilla. There may be shortening or lengthening and loss of function (least loss in the subspinous variety). There is abnormal immobility and the circumference of the shoulder is increased.

Describe the treatment of shoulder dislocations.

Increase the deformity and move in the direction of least resistance. Place in the Velpeau position for a week and watch the part carefully for several more weeks.

Axillary:—Flex and supinate the forearm to relax the long head of the biceps. Abduct the elbow (to relax the deltoid and supraspinatus) to a right angle. Apply traction with one hand and with the other lift the head into the socket.

Subcoracoid:—Reduce in a similar manner, rotating the arm outward to relax the spinati and teres minor muscles.

Subclavicular:—Exert traction in the direction of the deformity and then reduce as above.

Subspinous:—Abduct the arm to the side of the head and rotate inward to relax the subscapularis muscle. Replace by pressure during adduction.

Other methods:—Right angle traction with counter-extension with foot or sheet, or with the knee in the axilla. Place a pad in the axilla and bandage the arm to the chest. Kocher's method:—Push the arm

to the side with forearm half flexed, carry the forearm outward, carry elbow forward and rotate arm inward and put in the Velpeau position.

What is the treatment for ancient dislocations?

They may be reduced even after ten weeks. The contra-indications are excessive inflammation and probably arterio-venous adhesions. The adhesions should be broken up several times beforehand; then use manipulation and traction. If all these methods fail, section or resection may be resorted to. The complications are ruptured vessels, nerves, muscles or bone abscesses.

Mention the varieties of dislocations of the radius and ulna.

Backward (the most frequent), occuring at times with fracture of the coronoid process; forward, inward and outward or lateral.

What are the causes and symptoms of backward dislocations of the bones of the forearm?

Causes:—Indirect violence, especially falls on the hand.

Symptoms:—Slight flexion, fixation (may be moderate motion), shortening, tense biceps and brachialis anticus, pain, and the olecranon found above the intercondyloid line.

Give the treatment and prognosis of backward dislocations of the elbow joint.

Treatment:—Reduction is by extension of the forearm and counter-extension on the lower end of the humerus (i. e., in the direction of the deformity) by knee or hand, and then flexion or hyperextension and traction. See that the head of the radius is in place.

After treatment:—Retain in the flexed position for two or three weeks and then use passive motion. Do not put the arm up too long.

Prognosis:—Good. There is usually no stiffness.

Describe forward dislocation of the elbow joint.

This is rare and always occurs with fracture and is due to direct violence.

Symptoms:—Supination of the forearm, which is held at a right angle.

Treatment:—Flex the forearm and press into position.

Describe lateral dislocations of the elbow joint.

These are usually subluxations. They are treated by moderate extension and direct pressure. There is usually much swelling and results are not satisfactory.

What are the varieties of dislocations of the radius?

Forward (frequent); backward, with fracture of the ulna high up; outward, downward (subluxation in children quite frequent from lifting the child by the arm).

What are the symptoms and treatment of dislocations of the radius?

Symptoms:—The head of the radius is absent and the arm is extended in an abnormal position. The ulna is found all right.

Treatment:—Placed in the extended position, the reduction is often very difficult. Under ether make extension, counter-extension in the line of least resistance and manipulation. If you fail to reduce, you are justified in resecting the head of the radius. Retention is often very hard. The anterior splint and pad should be applied for three weeks.

The downward dislocations or the subluxations of children present a deformity. There is impaired flexion and pronation. They are reduced by extreme supination.

What can be said of dislocation of the upper end of the ulna?

It is seldom dislocated alone, but it may occur backward, with a high fracture of the radius.

Symptoms:—Fixation at a right angle and pronation. The radius is in place.

Treatment:—The same as for both bones.

Describe dislocations of the lower end of the ulna.

The dislocation may be backward from extreme pronation or forward from extreme supination (with Colles' fracture).

Treatment:—Reduction—Fix the radius and press the ulna into position. Retention—Place in anterior and posterior splints for three weeks.

Describe dislocations of the carpus.

These are very rare without fracture (Colles'). They may be either forward or backward. Find the relation of the styloid processes to the hand.

Treatment:—Extension and flexion and extension of the hand.

Describe dislocations of the single bones of the carpus.

These are frequently met with. They are dislocated upward. They are treated by pressure and manipulation. Failing in this, excise or let alone.

Describe dislocations of the metacarpal bones.

These are frequently met with in baseball players. They are dislocated upward and backward. They are treated by extension, counter-extension and manipulation.

Describe dislocations of the phalanges of the hand.

These usually occur at the metacarpo-phalangeal joint and are easily diagnosed.

Treatment:—Reduction is usually easy. Traction is made with the hand or the clove hitch, or by the Levis method, or with the Indian puzzle. Apply extension and counter-extension.

Occasionally reduction is only with great difficulty, especially in dislocation of the proximal phalanx of the thumb.

Describe the treatment for dislocation of the proximal phalanx of the thumb.

Special manipulation is necessary, as the head of the metacarpal bone is caught between the tendons of the flexor brevis pollicis, or the flexor longus pollicis, or the anterior or glenoid ligament. Extend the thumb on the wrist until it points toward the elbow. This relaxes and separates the heads of the muscle, and with flexion pressure on the other side, the thumb can be flexed. Dress for three weeks in a spica bandage. If this method fails incise on the palmar surface, divide the two tendons of the flexor brevis, put aside the flexor longus and open the capsular ligament. If all this fails resect the head of the metacarpal bone or amputate. Hutchinson recommends the introduction of a tenotome from the dorsum, behind the projecting base of the phalanx and the division of the glenoid ligament to allow the sesamoid bones to slip on either side of the metacarpal head. In this way no important structures are cut and it will not interfere with the subsequent utility of the joint (British Med. Journal, Jan. 5, 1898).

DISLOCATIONS OF THE LOWER EXTREMITY.

Describe and give the varieties and pathology of dislocations of the femur.

They comprise about 5 per cent. of dislocations and are caused by indirect violence.

Varieties:—Forward, two varieties; and backward, which are more common, two varieties. 1. Iliac (upward and backward). 2. Ischiatic

(backward). 3. Thyroid (forward and downward); third in frequency. 4. Pubic (forward and upward); the rarest.

Pathology:—The capsular and teres ligaments are always torn. The femoral vessels may be injured in the forward dislocations and the sciatic nerve may be injured in the backward. The ilio-femoral ligament usually remains untorn.

How are dislocations of the femur treated?

Under profound anaesthesia, manipulate, extend and counter-extend carefully in the direction of the deformity. Failing in this, excise the restricting tissue, or section of the neck, or excision may be necessary.

Describe the backward and upward, or iliac dislocation of the femur.

Causes:—Adduction and inward rotation, or rotation alone, or a force from below when the legs are crossed.

Symptoms:—Slight flexion, adduction and inward rotation. The knee is in front and above the other and touches the other thigh. The foot is inverted and the ball of the toes is on the opposite instep. The hip is prominent and the head can be felt on the dorsum. There is shortening (one to three inches) and abnormal immobility.

Describe the backward or ischiatic dislocation of the femur.

Causes:—It is produced by the same causes as the above, but with the thigh at a right angle and adducted and rotated inward.

Symptoms:—The same as the above, only to a lesser degree. Shortening is shown by Allis test. There is numbness and tingling of the parts to which the sciatic is distributed. Pelvic examination internally shows the head.

Give the treatment for posterior dislocations of the femur.

Etherize and place on back. Grasp the foot and the knee, flex the leg and thigh, increase the deformity and go in the direction of least resistance. Flexion, adduction and outward rotation. Failing in these methods, make several attempts at different periods by extension and counter-extension in the direction of deformity. Failing in this, use operative measures.

Describe forward and downward, or thyroid dislocations of the femur.

Cause:—Force applied with limb extended.

Symptoms:—Lengthening (one to one and a half inches), slight abduction, foot extended, heel raised, body bent to the injured side and flat hip (the trochanter being out of place).

Treatment:—Etherize. Manipulate in the reverse order of backward dislocations; abduction and inward rotation. Apt to produce a backward dislocation.

Describe the forward and upward or pubic dislocation of the femur.

Causes:—Over-extension of the thigh, with outward rotation, or a blow on the foot.

Symptoms:—Shortening, abduction, eversion, slight flexion. The symptoms are more marked than in the above. There is a flat joint and the head is above the pubes.

Treat the same as the above.

Mention a few facts about ancient dislocations of the femur.

They may be reduced after six or eight weeks, and they have been reduced after five years. Employ careful and long and repeated manipulation with extension and counter-extension. The contra-indications for treatment are much inflammation and an altered head and acetabulum. If there is much deformity, section of the neck or below the tro-

chanters may be required, or excision of the head and the formation of a false joint.

Describe dislocations of the tibia.

They comprise about 1 per cent. of dislocations.

Varieties:—Forward, backward, outward, inward, rotary (rare), complete, partial and pathological.

Pathology:—These dislocations are serious, especially if complete. There is laceration of the ligaments, muscles and vessels (may require amputation). The crucial ligaments are usually torn.

Symptoms:—They are self-evident, especially the complete, and are without swelling.

Treatment:—Traction, rotation and manipulation. Apply a posterior splint for several weeks. Use massage and passive motion. Ankylosis is frequent.

Describe dislocations of the fibula.

These are rare and may be outward and forward, backward and upward. They may be reduced by pressure on the head of the fibula. They are associated sometimes with fracture. The action of the biceps femoris tends to aid in the production of this dislocation.

Describe the dislocations of the patella.

Varieties:—Outward, the most frequent; inward, rotary (on its axis), combined. Rotation is occasionally complete and occasionally habitual.

Causes:—Muscular action and direct violence.

Treatment:—Extension and flexion in alternation and manipulation. Incision and forcible replacement may be necessary.

Describe dislocations at the ankle-joint.

Varieties:—Dislocations of the foot backward, forward, laterally and often associated with fracture. Compound dislocations of the ankle are serious. Dislocations of the lower end of the fibula are rare, usually occurring as Pott's fracture.

Treatment:—Relax and loosen the tendo Achilles by flexing the leg. Use direct pressure and manipulate the foot. If it cannot be held in place, divide the tendo Achilles.

Describe dislocations of the tarsus.

A dislocation may occur of any bone of the tarsus. They are usually easily diagnosed. They are treated by pressure and manipulation. Failing in this, excision is the proper procedure.

Describe dislocations of the astragalus.

This dislocation is the most frequent of all the tarsal bones. The dislocation may be forward, backward or lateral. The backward usually needs excision, as reduction is difficult. The forward and lateral dislocations are reduced by flexion, traction and pressure. Division of the tendo Achilles may help.

What can be said of dislocations of the metatarsal bones and the phalanges?

These are usually severe injuries and require amputation. Otherwise they should be treated as dislocations of the carpus and fingers.

DISLOCATIONS OF CARTILAGES.

Give a description of dislocations of the semi-lunar cartilages.

Varieties:—They are usually backward, rarely forward, and occasionally both, but usually the inner. Occasionally they occur in both knees.

Causes:—Excessive flexion, sudden wrenches, lax or lacerated ligaments or diseased joints. They are common in middle life.

Symptoms:—Sudden, intense and sickening pain following an extreme flexion. Position of extreme flexion. Patient cannot extend the leg, nor can it be extended by force. In recurring cases there may not be extreme flexion.

Sequellae:—There is usually a synovitis and possibly abscess.

Treatment:—Hyper-flexion over the end of a table or knee, then extension with the hand on the calf. This should be done under ether. Immobilization should be kept up for three weeks, using a plaster of Paris cast or a knee cap. Fight the inflammation. If there is failure of reduction or recurrence, incise over the cartilages, draw the cartilage to the head of the tibia and stitch there, using antiseptic dressings. Failing in this, excise.

Describe dislocations of the costal cartilages.

These are rare, occuring from the sternum, ribs or the mutual junctions.

Causes:—Direct or indirect force.

Symptoms:—Depression and prominence.

Treatment:—Moulding and manipulating, assisted by moving the shoulders and inspiration and expiration. Use the proper bandages and pads or adhesive plaster.

Describe dislocation of the ensiform cartilage.

There are two cases recorded. The symptoms are those of pressure and depression. They are treated as the costal cartilages, or are drawn forward with a hook or the finger. It may be necessary to excise.

MUSCLES, TENDONS, BONES AND JOINTS.

DISEASES AND INJURIES OF MUSCLES.

Describe ruptures of muscles.

These conditions usually occur from blows or sudden unopposed contraction, or after the degeneration of the fibres (typhoid, scarlet, yellow fever, etc.)

They are most common in the rectus abdominis (symptoms of obstruction or peritonitis), rectus femoris or adductors, calf muscles, psoas and forearm flexors.

Symptoms:—Usually pain, depression, loss of function and ecchymosis.

Treatment:—The torn, ruptured parts should be approximated by position, rest and compression. A suture may be used in a healthy muscle.

Describe herniae of muscles.

A hernia is a protrusion of a portion of the muscle through the fascia, accompanied by diminished power.

Symptoms:—These appear when the muscle contracts and disappear when it relaxes. The opening in the fascia may be felt.

Treatment:—Systematic pressure should be used in recent cases, and a freshening of the parts and suturing of the opening in old cases.

Describe contractures of muscles.

These consist in persistent shortening of the muscle.

Causes:—Cicatricial contractions (intra or extra), inflammations (traumatic, specific, infective), disease of the neighboring bone or joint, weak antagonist, connective tissue changes, sclerosis following paralysis from spinal or cerebral lesion, reflex irritation from local injuries or retained foreign bodies.

Symptoms:—Those of chorea, hysteria, etc.

Treatment:—Division or tendon section (in those tendons having no sheaths) and tendon lengthening (in those that have sheaths).

DISEASES AND INJURIES OF TENDONS.

Give a description of rupture of tendons.

These usually occur in the tendon of the rectus femoris, the ligamentum patelle, the tendo Achilles and of the triceps or biceps cubiti.

Causes:—Sudden violence or muscular efforts.

Symptoms:—There is a snap, loss of function of the attached muscle, pain and a gap which is enlarged on contraction of the muscle.

Treatment:—Approximation and fixation by position and immobilization; or, better still, suture the parts.

What are the varieties and treatment of wounds of tendons?

Varieties:—Subcutaneous from tenotomy or rupture, and punctured wounds, which are dangerous because of infection; open wounds, operative or accidental.

Treatment:—In all open wounds, suture. In those resulting from tenotomy or operation, use position and pressure. In punctured wounds be careful about disinfection; usually enlargement is necessary.

Describe the repair of tendon wounds.

In case the tendon ends will not meet by the ordinary method of suturing, use the Czerny method in those having sheaths, or apply catgut between the ends, or unite the severed sheath(?). Transplantation may be tried, either from the patient or from a lower animal, or tacking the end of the tendon to a similar one. Use the Esmarch band. In the wrist, see that the tendon ends correspond.

Describe the dislocations of tendons.

These are rare without fracture or dislocation.

They usually occur in the peronei, especially the brevis, and in the latissimus dorsi at the lower angle of the scapula, and the biceps.

Treatment:—Reduction is easy, but retention is hard, and it may be necessary to aid with sutures and immobilization.

What is a ganglion?

It is a small, round, hard and tense swelling found close to a tendon on the back of the hand. It is painless and is only inconvenient if the tendon is much used, or for cosmetic reasons, or from size. It contains a viscid honey-like substance.

Pathology:—It was previously thought to be a hernia of the sheath of the tendon or a dropsy of the sheath (weeping sinew). It is probably an outgrowth of the synovial follicles and has no connection with the sheath, or it is a colloid cyst independent of the sheath.

Treatment:—Pressure or a sharp blow. Incision and evacuation (apt to refill). Excision.

Give a description of palmar abscess.

This is the most important variety of tendon inflammations. It usually begins in the flexor tendons of the fingers and results especially

from punctured wounds. If its course is unrelieved, it proceeds to the dorsum, and under the annular ligament and up the forearm to the elbow. There is often a superficial abscess, which is opened and the deep trouble overlooked.

Treatment:—Early, deep and thorough incision, and thorough disinfection and antiseptic dressings. Do not poultice.

What is paronychia or felon?

It is an inflammation of the finger, rarely of the toe.

Varieties:—Superficial of one or several fingers in succession. Found in children and weak subjects. They may be serous and slight or suppurative and severe, even so much as to destroy the nail. This is a condition called 'run around."

Causes:—They result from slight injury and usually from puncture. The severity depends on the condition of the part and the virulence of the germs.

Treatment:—Cold applications or antiseptic fomentations. Incision and antiseptic dressings. Look out for a superficial suppuration associated with a deep, in which case no relief would follow the incision.

Describe deep whitlow or bone felon.

This usually occurs on the palmar surface of the terminal phalanx.

Cause:—It usually results from a slight injury in a debilitated subject.

Symptoms:—Intense pain, swelling, pulse accelerated, fever, etc. There is tenderness on the end of the finger. It is often associated with a superficial abscess.

Treatment:—Incision cannot be too early or too often. Use antiseptic dressings and pack. Avoid the use of carbonic acid, as it causes gangrene of the fingers. In the terminal phalanx always cut to the bone. In the thumb and little finger, if suppuration persists, necrosed tendon usually results, which should be treated by excision.

Describe a teno-synovitis or a thecitis.

Varieties:—Acute, suppurative and non-suppurative.

Causes of the acute non-suppurative:—Traumatism (contusion or a sprain), rheumatism, syphilis or gonorrhea.

Symptoms:—Pain and swelling along the course of the tendon and crepitation before and after the absorption of the effusion.

Treatment:—Rest and pressure. Apply splints and bandages and hot or cold applications. Paint with iodine.

Acute suppurative teno-synovitis.

This variety is dangerous, and if incision is not made early, there is a destruction of the tendon and the sheath and a spreading of the inflammation to the neighboring tissues and a destructive burrowing.

Symptoms:—Intense pain, throbbing and tenderness. Rapid and marked swelling. Redness. Marked constitutional disturbances.

Treatment:—Early incision and disinfection.

Describe chronic teno-synovitis.

This condition is usually tubercular. It occurs as a firm swelling in or upon the sheath of the tendon. It contains granulation tissue, more or less fluid and rice-like bodies. Its usual location is in the forearm, but it is also found along the tendons of the ankle and the knee. The inflammation spreads up and down along the tendons and to the neighboring joints, from which it may also originate. It may break into the surrounding tissues and form a tubercular abscess. Occasionally there is a spontaneous disappearance.

Symptoms:—The course is slow; there is little functional impairment. The inflammation is spindle-shaped and feels solid (granulation

tissue). There may be fluctuation (fluid) or crepitation (rice kernels). The "hour-glass" variety is a compound ganglion of the palm and wrist.

Treatment:—Rest and pressure (cast), anti-tubercular remedies, tapping and injection, incision and scraping, excision (Esmarch band).

What are the different diseases affecting the bursae?

Bursitis, acute, chronic, superficial and deep; housemaid's knee; miner's elbow; bunion.

Describe the different forms of bursitis.

They may be acute or chronic and superficial or deep. The superficial usually have a good prognosis, excepting that there is danger of cellulitis. The deep are dangerous on account of the joint.

Symptoms:—Acute:—1. Superficial:—Pain, tenderness, redness, swelling, location significant, limited shape. 2. Deep:—Resemble joint inflammation, except that they are more limited. They often involve the joint.

Treatment:—Rest, elevation, pressure, cold, aspiration, incision (pus), disinfection. Also general treatment when from syphilis, rheumatism or gout.

Chronic:—This common. There is little distress. Swelling from distention of the sac and thickening of the sac.

Give the treatment for housemaid's knee and miner s elbow.

Aspiration. Incision. Excision.

In subligamentous bursa (patella) there is swelling at the sides, and it often communicates with the joint. Tnere is also a bursa under the semi-membranosus tendon; hence, aspiration is safer.

What is the treatment for bunion?

If it is acute, rest and cold, etc., should be ordered. Aspiration, incision and disinfection may be used. Replace the toe. Remove the diseased bone, if any.

SURGICAL DISEASES AND INJURIES OF THE JOINTS.

Give a description of synovitis.

Synovitis is an inflammatory disease of the synovial membranes. If confined to the synovial membrane alone, the cause is usually traumatic. The disease usually progresses by extension.

Symptoms:—Pain, which is worse on motion and at night. The joint is hot, swollen and tense. It is also fluctuating, and the patient seeks the most comfortable position for the limb.

Treatment:—Rest, cold, heat, elastic pressure. Occasionally aspiration is necessary, when everything should be surgically clean.

Internal remedies:—Apis, Arnica, Rhus tox., Bryonia.

Describe chronic synovitis, giving symptoms and treatment.

There is an oedema of the synovia and an effusion with thickenings and adhesions.

Symptoms:—The most important is effusion.

Treatment:—Rest, pressure, baths, friction massage, counter irritation, aspiration. Hydrops articuli or hydrarthrosis may require aspiration and the injection of carbolic acid (3-5 per cent.), but only after the inflammation subsides.

What is arthritis?

It is an inflammation of a whole joint, the causes of which are:

Pyogenic cocci, tuberculosis bacilli, infectious diseases, gonococci, rheumatism, gout, syphilis, tabes.

Describe tubercular arthritis.

This is the most chronic of joint diseases.

Pathology:—It results from a primary deposit of the tubercle bacilli in the bone, synovia, capsule, or the peri-articular soft parts. In children the deposit is usually in the bone.

Symptoms:—Pain in the bone, lameness, bony ankylosis, general or distinct localized tuberculosis. Sepsis, amyloid changes and exhaustion.

Treatment:—General—Medicinal. Local—Rest. Aspiration, if the effusion be great. Condensing or specific injections of iodoform, Peruvian balsam, zinc chloride or the acid lime phosphate. Operative:—Erasion. Excision. Amputation.

Describe hip-joint disease, giving the three stages.

This is a morbus coxarius, and is found in children especially, the deposit being in the femoral epiphysis. It is occasionally in the acetabulum and rarely in the soft parts. There are three stages: 1. Irritation. 2. Arthritis. 3. Destructive.

First stage, or that of irritation:—The symptoms are obscure, a slight lameness toward evening; b, pain, especially at the knee (osteal); c, slight atrophy of the thigh; d, rigidity of the muscles, especially the adductors; e, tenderness at the hip; f, night cries.

Second stage, or that of arthritis:—a, Limp, decided; in standing the weight is put upon the sound limb; b, Pain along the obturator nerve; c, Marked atrophy and also adductor rigidity; d, Position of the limb; e, Apparent legthening; f, Swelling; g, Gluteo-fermoral crease changed; h, Arching of the spine.

Third stage, or that of destruction:—Rupture of the capsule and erosion of the head and acetabulum cause an apparent luxation; b, Shortening; c, Flexion; d, Some adduction and inward rotation; e, Arching of the lumbar spine marked; f, Abscesses, cold or from infection internally or externally; g, Destruction of the bone and soft parts; h, Healing with ankylosis or amyloid disease, and visceral tuberculosis.

Prognosis:—This depends on the treatment. Many die late from visceral tuberculosis. In adults, the prognosis is bad. Recovery is only after years, and then with impaired function. There is relief after breaking up the abscesses.

Treatment:—Recumbency with extension in the line of the deformity. Gradual straightening. Treat also constitutionally. Fixation and extension by the Seth Thomas apparatus. Motion and extension with braces having hinges, etc. Operative treatment:—Injections (?). 2. Osteotomy. 3. Excision, erosion. 4. Circumcision in obscure cases.

Remedies:—Rhus, Stramonium, Belladonna, Iodides and Arsenic.

Describe knee joint disease and give the symptoms and treatment.

This is usually osteal and in the femur, occurring especially in children. In adults, it usually occurs in the soft parts. "White swelling."

Symptoms:—Pain in the internal condyle. Effusion. Flexion. Rigidity. Atrophy. Abscesses. Luxation. Ankylosis, or destruction, sepsis, etc.

Treatment:—Rest. High shoe for the well foot and crutches. Thomas knee splint. Injection. Cast, which persisted in often cures. Erogidity. Atrophy. Abscesses. Luxation. Ankylosis, or destruction, sion. Excision. Amputation.

Describe ankle-joint disease.

This is usually of the synovial structures of the joint. Occasionally it is from the tarsus, or is found in the astragalus, or a malleolus, or tendon sheaths, or later as an an ostitis.

Symptoms:—Swelling. Pain. Impaired function. Extension.

Treatment:—Immobilize the foot at a right angle. Employ injections. Operation:—Usually excision or amputation.

What can be said of shoulder-joint disease?

This is rather rare. It is usually found in adults or adolescents. Caries sicca is common.

Symptoms:—In the moist variety we have effusion and abscesses. In the dry, pain, atrophy, a sub-acromial hollow and imperfect rotation and abduction.

Treatment:—Rest. In case of abscess, incise. Excision is attended with good results.

Describe elbow-joint disease.

This is usually found in children and is a disease of the synovial structures especially. If the disease is osteal, it is of the humerus.

Symptoms:—Pain, especially of the bone. Stiffness. Flexion. Pronation. Effusion, especially posteriorly. Atrophy (slow).

Treatment:—Fixation at a right angle or less. Injections. Excision. Incision. Amputation is rarely necessary.

Give a description of wrist-joint disease.

This usually comes from disease of the carpus or from a teno-synovitis. It occurs in children, adults and old people.

Symptoms:—Swelling, on the dorsum especially. Flexion. Abscess early.

Treatment:—Immobilization. Injection. Operative:—Usually early erosion or excision.

Describe sacro-iliac disease.

This is a sacro-coxalgia. It is found especially in adolescents and also in children. The prognosis is unfavorable.

Symptoms:—Pain on motion and on pressing the ilia together. It is of a radiating character. The psoas is tense. There is a limp. The position is the same as in the second stage of hip-joint disease.

Treatment:—Fixation. Counter-irritation (cautery). Open the abscess. Injections. Treatment is unsatisfactory.

Describe septic arthritis, giving the pathology, symptoms and treatment.

This disease is a result of infection by suppurative bacteria. It will destroy the joint and often the life of the patient, unless successful treatment is employed. Infection may be through an external wound (primary or secondary). It may also come from an internal wound (osteomyelitis, or a neighboring suppuration). It may come through the circulation from pyaemia.

Pathology:—There is an exudate into the joint and synovial structures and connective tissue. This breaks down into pus. The articular cartilages ulcerate or necrose. The ligaments soften and luxations occur. Abscesses form in the surrounding tissues and a general sepsis results.

Symptoms:—Severe pain, worse at night and on motion. There is great swelling and oedema, heat and redness. Deformity from the patient trying to find the most comfortable position. There are grave constitutional symptoms:—Chill; fever; first a sthenic and then a typhoid state. Acute septicaemia and death.

Treatment:—Early incision, thorough disinfection, free drainage and occlusion. Occasionally aspiration and washing out of joint are required. There should be the most thorough antisepsis and immobilization. The cure may be by ankylosis, which may be prevented by an early incision. Constitutional treatment:—Keep up the strength. Resort to stimulation. Arsenic.

Occasionally, erosion, excision or amputation.

Describe infective arthritis.

This is similar to septic arthritis. It may be the result of pus organisms, as in erysipelas or from organisms of the disease present in the body, e. g. typhoid (hip especially), scarlet fever (poly-articular), measles (poly-articular), small-pox (poly-articular). There may be suppuration, but often there is not. If there is, it usually subsides quickly.

Treatment:—Treat as septic arthritis, if there is suppuration.

Describe gonorrhoeal or urethral arthritis, giving the cause, symptoms and treatment.

This is another name for gonorrhoeal rheumatism. It may be an arthralgia (intermittent, evanescent), or a hydrarthrosis (knee), or acute sero-plastic arthritis, or a suppurative arthritis (rare).

Cause:—Neisser's gonococci or their ptomaines. It is rare in women. It appears late in clap usually. Two-thirds of all cases occur in the knee. The ankle, heel, toes, fingers and the tendo Achilles are also affected. It is usually mono-articular.

Symptoms:—These vary with the variety.

It is mono-articular. The temperature is low. No profuse sweating or heavily-loaded urine as in rheumatism. Often retrogrades slowly toward recovery.

Often effusion becomes permanent. Plastic material thrown out tends toward the formation of a fibrous ankylosis. Destruction of the joint may result.

Treatment:—Rest and fixation. Good position. Passive motion as soon as possible to prevent ankylosis. Massage. Aspiration when effusion persists.

Remedies:—Pulsatilla, Rhus, Bryonia and Hepar.

Describe hydrarthrosis.

It is a serous effusion into a joint, with a tendency to chronicity.

Causes:—It is a common result of many conditions in and about joints, coming from an irritation or an inflammation. The knee, shoulder, elbow and hip are the usual joints affected, particularly the knee.

Pathology:—Effusion, ordinarily serous, occasionally tinged with blood, containing at times shreds of fibrin, free oil globules or fat-crystals. Structural changes occur from long continuance. The synovial membrane becomes thickened, folds show marked induration and can often be felt as distinct ridges.

Symptoms:—Fluctuation. Articular outlines effaced. It is a chronic condition. There is no rise of temperature and no pain. The development is slow.

Treatment:—If recent, treat as acute synovitis with serous effusion. Friction. Massage. Elastic bandages. If unsuccessful, immobilize. Later aspiration may be necessary, followed by irrigation with a 5 per cent. solution of carbolic acid, allowing a few drops to remain in the joint.

Describe osteo-arthritis.

It is a rheumatoid arthritis, or rheumatic gout, or an arthritis deformans. It is a condition of degeneration and a proliferation of the structures entering into the formation of a joint.

Causes:—Not well known. Trauma is an important immediate cause. It appears after middle life in persons with an arterio-sclerosis, or it may develop in young persons, particularly in girls after the appearance of menstruation.

WOUNDS OF JOINTS.

Describe the varieties of joint wounds.

Non-penetrating—These are only dangerous from extension of the suppuration. They may cause deformity by contractions in healing. They should always be treated carefully.

Penetrating—These are always serious, though if treated carefully they usually recover well. Badly treated, there may result a loss of the joint, or of the limb, or of life. The future of the joint, limb or life depends on the first one who treats the case.

Causes—These are usually from stabs, tools or bullets.

Symptoms:—Discharge of synovial fluid. Swelling from haemorrhage and effusion. Then synovitis, simple or suppurative, occurs, etc. Gunshot wounds in war have usually required amputation or excision. In civil practice and in these antiseptic days this is not necessary.

Treatment:—First, unless there is haemorrhage, apply antiseptic dressings. Do not probe with finger or instrument. Primary operative treatment is probably best. Enlarge the wound. Remove loose pieces of bone. Chisel off uneven places. Search for the ball. In the bone it should be chiseled. Remove any foreign body. Apply ample drainage. If both epiphyses are injured, excise with a view to obtaining ankylosis.

Describe sprains, giving their symptoms and treatment.

These are most frequent in the ankle and wrist.

Cause:—They usually result from a wrench or a fall, and they may only be slight and end in a fracture or a luxation. The lesion is usually in the part of the capsule in which there is the least motion. The synovial membrane is stretched on one side and pinched on the other. The ligaments sometimes stretch and tear, and there may be laceration of the vessels and soft parts. Sprains occur most in deformed limbs or those with lax ligaments.

Symptoms:—Exclude luxation and fracture. There is severe pain at once, then relief, then a return of the pain from swelling. The swelling is from the effusion and haemorrhage which occurs especially at the loose joints. Deformity. Ecchymosis. There is abnormal mobility, and the lacerated ligaments can be felt. Sprain fracture occurs sometimes at the ankle, and hence many cases of ankylosis result from a sprained ankle.

Treatment:—Rest and cold. Later, hot applications. Compression. Fixation. Adhesive strapping; then massage. Aspirate for excessive exudation with the usual necessary precautions.

What is ankylosis and what are its causes?

Ankylosis is a condition resulting from cicatricial contractions in and about a joint. Impaired motion from contractions of muscles or burns is not ankylosis.

Causes:—I. Organized blood clot. 2. Organized exudate in the joint 3. Organized exudate around the synovial membranes. 4. A combination of the above.

Give the varieties of ankylosis and the treatment.

An ankylosis may be fibrous or ossification may set in and it may become bony. It may also be partial or complete. The ossification may be external or internal. When internal, erosions must have taken place into the bone. The bony variety usually follows a septic myelitis and is usually complete. The fibrous variety is more frequently partial, usually resulting from a non-suppurative inflammation.

Treatment:—This depends on the variety, the angle and the joint involved. Preventive treatment consists in limiting the inflammation and in passive motion. The curative treatment consists in waiting, as

time will usually work wonders after a fracture or dislocation, if properly reduced. Forcible breaking up is followed by relapse in the fibrous variety and by destructive inflammation in the bony variety.

Bony:—If the position is good, leave alone, excepting in elbow cases, where excision will give a good joint. If in a vicious position, resort to excision in cases of the knee, elbow, etc., or to osteotomy if in the hip.

Fibrous:—If it persists after massage and the inflammation has gone, divide the contractured tendons first, and then break up the adhesions under an anaesthetic. Fix and immobilize the parts for two or three weeks. Accidents may occur to the vessels, nerves and soft parts and an acute inflammation may be set up. Occasionally it is best to correct the ankylosis slowly.

DISEASES OF BONE.

Describe atrophy of bone.

It occurs in old age, and it may result from prolonged disuse. This should be remembered when reducing luxations. Pressure also causes it, such as from aneurysm (sternum and spine). Injury to the nutrient artery is also a cause, as are also affections of the epiphyseal line.

Describe hypertrophy of bone.

This may be congenital with soft parts, or compensatory from over-use (fibula). It may also result from chronic inflammations (hereditary syphilis and ostitis deformans).

Mention the various inflammations of bone.

Rarefying ostitis or osteo-porosis or caries sicca. Condensing ostitis or osteo-sclerosis.

Caries sicca and necrotica.

Bone abscess:—Acute or chronic and usually occurring in heads of bones, the cause being injury, a tubercular diathesis, syphilis, infectious diseases, typhoid or pus organisms.

NECROSIS.

Give a description of necrosis.

It is a death of tissue in visible and more or less circumscribed masses, applied especially to bone and corresponding to gangrene of soft parts.

Causes:—Anything that destroys the vitality at once, e. g., heat, cold, crushes, etc., or arrested circulation. Periostitis with detatchment. Ostitis, Endostitis. The most frequent cause is osteo-myelitis or a compound fracture. Other causes are traumatic or non-traumatic infection.

Phosphorus causes a necrosis of the jaw by the fumes of phosphorus entering through the decayed teeth. This is much more severe here than elsewhere. It begins as a perostitis, with the production of osteophytes.

Mercury fumes or the excessive use of it causes a necrosis of subcutaneous bone (jaw). It is now very rare. The alveolar processes of the lower and upper jaws are particularly involved.

Pathology:—It usually occurs in compact bones when it is dry. In cancellous bones it is moist. It is usually accompanied by ravages from granulation tissue, the result of specific irritation. Septic processes may shut off large areas from blood supply. The bone therefore dies in small particles or the entire shaft of a long bone or several smaller ones may become involved in the destructive process. The portion which dies is known as the sequestrum. It may be of various shapes,

according to the nature of the cause. It is white and ivory-like in hardness. The involucrum is the new osseous tissue, which results from a strengthening process which accompanies the weakening process, as if to tone the pathological weakness and strengthen it. The opening in the sound bone leading to the sequestrum is called the cloaca.

Symptoms:—Periostitis, ostitis, medullitis, followed by suppuration and discharge. It is impossible to diagnose it from caries and abscess until openings form. The symptoms are usually better when the discharge takes place and worse when a new abscess forms. There is a separation the last weeks or months. Chronic discharge. Appearance of bone sinus. Impaired health. Waxy changes. The separation is recognized by the mobility of the sequestrum.

Prognosis:—Usually good. The dangers are exhaustion, pyemia, inflammation of important structures by spreading (brain, joints).

Treatment:—Control and reduce inflammation. Incision. Trephining, etc. Remove the bone as soon as loosened. Try to have an involucrum form, and don't weaken too much. Operate early if there are dangerous symptoms. Try to preserve the periosteum. Employ sequestrotomy. Make an opening with strong bone forceps and chisel; curette all the lining membranes. Thoroughly cauterize the cavity and pack. In favorable cases cleanse cavity without caustics and try to have a blood clot form, which will organize into connective tissue, to which apply green silk protective and the other dressings. The healing by the aseptic blood-clot method is the ideal one.

Define and give the causes, symptoms, pathology and treatment of periostitis or osteo-periostitis.

Periostitis is an infectious inflammation of the periosteum and also the outer surface of the bone, with acute and serious manifestations and a tendency to perforation and escape of pus.

Causes:—Traumatism. Cold. Diathesis. Certain fevers. Infection from without or from the circulation.

Pathology:—It may be localized over a small area or the entire periosteum of the shaft involved, in which case, so soon as pus forms and the periosteum is separated from the bone, there is probability of acute necrosis of the shaft, the disease here resembling acute rheumatism.

Symptoms:—1. Circumscribed—Pain worse at night, tenderness, heat, swelling, oedema, fluctuation or sclerosis. 2. Diffuse—Chill, fever, delirium. Young tubercular patients. Rapid pain, oedema, swelling from impeded circulation (confined to the shaft and not involving the joints). Distinguish from cellulitis and rheumatism.

Treatment:—Localized—Heat or cold if the veins are inflamed. Ichthyol. Incision to relieve from pain and pus. Iodine early and late. Iodide of potash and mercury when the cause is syphilitic.

Diffuse—Control the inflammation. Relieve the pain. Keep up the strength. Incise early.

Describe ostitis or osteo-myelitis.

It is a distinctly infectious process, sometimes limited to the bone marrow and internal portion of the bone, and sometimes apparently involving every particle of the osseous structure.

Causes:—Traumatism. Compound fracture. A syphilitic or tubercular diathesis. Infection. Exanthemata. They occur in youth usually. They are secondary in the old from the waking of a healed lesion usually.

Pathology:—There is a rarefying and then a condensing ostitis. Resolution is rare. There are cold abscesses and caries. Septic osteomyelitis acute, resulting in suppuration and necrosis, partial or complete; or acute localized abscess, usually starting in a healed lesion.

Symptoms:—1. Chronic—They are usually indefinite unless associ-

ated with periostitis. Dull, aching, rheumatoid pains, worse in damp weather and at night. Points of excessive tenderness on percussion. 2. Acute—This form occurs in the young. Acute fever, chill, delirium, pain and occasionally crepitus (displacement), redness and oedema, swelling, septicemia and pyemia and epiphysitis if near the epiphysis.

Treatment:—As in the above. Incision and chiselling into the medulla. Trephine, cleaning out as soon as the symptoms become urgent. Relieve the pain. Keep up the strength. Occasionally amputation is necessary. In acute central abscess, trephine and remove bone chips. Treat the chronic in the same way. Relieve the tension if no pus.

Give a description and the pathology, symptoms and treatment of caries.

Caries occurs especially in cancellous bone and is usually tubercular or syphilitic in origin. It is often caused by some exciting trauma.

Pathology—There is a molecular death with liquefaction of the bone, forming the cold abscess or ulcer. There is a discharge of fatty debris, and if exposed to the air, of pus. As a result, irregular hollows are formed, and these are surrounded by a rarefying, and then a condensing ostitis. Healing results by granulation and cicatrization. Encapsulation and calcareous infiltration occasionally occur. Coxitis. Pott's disease. White swelling. Primary or secondary synovitis.

Symptoms:—Ostitis. Periostitis. When opened, it does not heal, but persists. There is soft, tender bone, which bleeds easily.

Treatment:—General—Iodine, cod-liver oil. Hygiene. Sea air. Guaiacol. Local: Cleanliness. Disinfection. Prevention of infection. Rest especially.

Surgical treatment:—Incision and curetting when the bone is softened. Iodoform. Iodoform in glycerine, ether and oil. Hot iron cautery. Lannelongue's sclerogenic treatment with zinc chloride. Hydrochloric acid and pepsin. In cold abscesses trephining.

Describe acute bone abscess.

It is a term applied to deep and circumscribed collections of pus within the bone chiefly occupying the shafts of bones. Due to pyogenic cocci or tubercle bacilli.

Causes:—Infection. Traumatism. Awakening of a healed lesion.

Symptoms:—Deep-seated and boring pain, tenderness, often with considerable enlargement of the overlying bone. Pain is frequently nocturnal, possibly lasting for weeks or months.

Treatment:—Operative. Anaesthetize. Expose bone and explore thoroughly with bone-drill, chisel or other instruments.

What is rickets and what its pathology, appearances, causes, symptoms and treatment.

It is a diathetic condition, characterized by nutritional disturbances and organic irregularities. It is a disease of mal-assimilation. It is a disease of infancy and childhood and is common in all classes.

Pathology:—There is as a constitutional defect in the supply of calcium salt forming bone without enough compact tissue to strengthen it. This occurs especially in the ends of long bones under the periosteum. The bone is so warped, twisted, etc., as to resemble green-stick fracture. This results in a thickening of the epiphyseal extremities of the shafts of long bones and the outer table of flat bones. Children dying from this disease die rather from cerebral or other manifestations.

Appearances:—Cranium—Bones soft and yield to pressure; fontanelles remain open. Peculiar square head. Thorax—Rickety rosary on sternal ends of the ribs; kyphosis and lateral curvatures. Extremities:—Bow-legs, knock-knees, clubbing of the ends of long bones, bending of the neck of the femur, clover-leaf pelvis, flat-foot, club-foot, etc.

Cause:—Imperfect nutrition.

Symptoms:—Onset insidious and occasionally sudden. Head sweating at night. Pot-belly. Slow dentition. Slow closure of the fontanelles. Diarrhoea. Characteristic bony appearances and sensitiveness.

Treatment:—1. Hygienic. 2. Medicinal. 3. Local.

What are the principal symptoms of osteo malacia?

The bones are brittle or bend and phosphates are present in all secretions.

Mention the tumors found in bone.

Osteomata, enchrondromata, carcinomata, sarcomata.

ORTHOPAEDIC SURGERY.

What is meant by the term "orthopaedic surgery"?

It is a branch of plastic surgery and consists in the correcting or preventing of deformity in any part of the body, especially in the case of infants. It means literally the straightening of a child. Greek, orthos, straight, and pais, child.

What is genu valgum and what are its causes and treatment?

It is a condition known as knock-knee. It is a result of an overgrowth of the inner condyle of the femur and also from an inward curve of the femur at the lower end. Relaxed internal lateral ligaments are found in this condition.

Causes:—Rickets. In adults lax or weak ligaments. Flat-foot. Fractures.

Treatment:—That for rickets. Local—Baths, friction, massage, electricity. Braces. When disease ceases, osteotomy. Operations—Ogston, (Reeves) Macewen.

Ogston's operation aims at loosening the internal condyle with a chisel pointed forward, or saw cutting from above the adductor tubercle to the intercondyloid notch.

Macewen's operation is a chiselling through nearly the entire thickness of the bone, which is then fractured manually, straightened and placed in a plaster cast. The femur is cut on its inner aspect, just above the adductor tubercle.

What is genu varum?

It is a condition known as bow-legs. The legs bend outward at the knee and the bones of the leg may also participate in the curve.

Causes:—Rickets. Occasionally also in ostitis deformans.

Treatment:—Spontaneous rectification is more frequent than in the above. Mechanical treatment may be used in the shape of braces or plaster. Osteoclasis. Osteotomy. Operative results are not brilliant as regards function.

Describe antero-posterior curvature of the legs.

This deformity is occasionally found. It often rectifies itself.

Treatment:—Mechanical and preventive. Operative:—Cuneiform or linear osteotomy.

What are the varieties of talipes or club foot?

These are non-traumatic deviations from the normal position of the foot. The varieties are named from the position of the foot. When

the foot is in extension, it is called talipes equinus; when there is flexion, talipes calcaneous; when adduction, talipes varus; when abduction, talipes valgus. Or there may be combinations of these, or they may be combined with luxations of the ankle.

What are the causes of talipes?

Under or over-muscular action. Relaxed tissues. Abnormal position or shapes or relations of the bones of the foot. They may be congenital or acquired.

Describe the congenital variety of talipes.

This variety is usually an equino-varus. There is an elevation of the heel, an adduction of the foot, the inner border being raised. The anterior portions of the foot are flexed. The degree varies from a normal in babes to one most marked.

Causes:—Persistence of early foetal position, the rotation of the foot failing to take place. It often runs in families.

Prognosis:—Good if taken early. The development is usually impaired.

Treatment:—This may be manipulative, mechanical and operative. In babes it is quite reducible and can be held in place by a bandage, adhesive plaster, plaster casts or by felt or gutta percha splints. The mechanical treatment is by a special shoe and a band. This shoe consists of a steel sole-plate, to which the foot is strapped. From this plate an upright arises reaching to just below the knee. Strap foot to plate in deformed condition and use upright as a lever to reduce the deformity and to retain the foot in proper position.

The operative treatments are as follows:

1. Tenotomy (usually of the tendo Achilles). This is done subcutaneously with a guarded knife. The foot is then replaced in an over-corrected position and retained there by some stiff bandage or Taylor's club-foot shoe.
2. Phelp's operation.
3. Excision of the astragalus. Occasionally a section of the neck of the astralagus.
4. Cuneiform osteotomy.
5. Removal of cuboid and scaphoid bones.

Describe the non-congenital varieties of talipes.

They are usually a result of acute polyo-myelitis anterior and from infantile paralysis. It usually occurs in children when beginning to walk. Different varieties may occur on each foot. The deviation is more at the ankle; there is less lateral displacement, and it is associated with atrophy of muscles.

Prognosis:—It is worse than for the congenital variety.

Treatment:—Operation is resorted to if necessary. Braces, massage, electricity and the douche may be used. Elastic traction is also used and tendon grafting is employed.

Describe talipes valgus.

This is a non-congenital variety, occurring in feeble patients.

Symptoms:—Flat foot. Abduction of the anterior part. Elevation of the outer border. It is usually associated with knock-knee or spinal curvature, and it is found in rickets. The patient may have an associated displacement of the astragalus and the scaphoid and the ligaments of the os calcis, astragalus and scaphoid. Pain is a symptom in adults, but not in children. It occurs anterior to the internal malleolus (i. e., the junction of the astragalus and the scaphoid) and at the proximal ends of the outer and inner metatarsal bones.

What is pes planus?

It is a condition similar to talipes valgus, only in a slighter degree. It is the flat foot occurring in fat girls.

Symptoms:—A diagram of the print of the foot shows a broken down arch. The imprint is made by the foot on smoked cardboard or by the wet sole on a piece of paper. Pain, often associated with curved spine.

Treatment:—The treatment of talipes valgus and pes planus lies in giving tonics, in gymnastics, friction, the douche (hot or cold), the steel arch. If the ankles be weak, use the braces.

Operations:—Tenotomy of the peronei and other muscles, or even the tendo Achilles. Stretching of the gastrocnemius, manually or by Shaffer's shoe. Ogston's operation, removing the astragalo-scaphoid joint. The scaphoid has also been removed.

Describe talipes calcaneus.

This occurs from paralysis and is occasionally congenital.

Symptoms:—Flexion. Patient walks on the heel. The anterior portion of the foot is raised and abducted.

Treatment:—Manipulation and fixation by brace or bandages. Occasionally, shorten the tendo Achilles.

What is pes cavus and what is the treatment for this condition?

This is a condition of hollow foot, and is an increased arch from the contraction of the deep muscles of the foot, the peroneus longus and the plantar fascia.

Treatment:—Use a brace or resort to tenotomy or fasciotomy. Resection may be required or amputation(?)

What is hysterical club foot?

It is a rare condition occurring in neurotic patients, especially females. The diagnosis can be made by etherizing.

Describe hallux valgus.

It is a rare varus occurring in middle life or old age.

Causes:—The wearing of too narrow pointed shoes or stockings that are too small. It may be accompanied by bunion, periostitis or necrosis. It may be a condition in rheumatism and gout.

Treatment:—1. Mechanical, by means of a splint and a bunion pad or glove finger or hood.

2. Operative:—Excision of the joint. Division of the metatarsal bone, or, better, the Meyer's operation.

Describe bunion.

This is an enlargement and an inflammation of the bursa of the ball of the great toe usually. It may go to a periostitis or caries. It is associated with hallux valgus.

Treatment:—Replace the toe. Keep the toe at rest and apply cold. Aspiration may be necessary or incision and disinfection. Removal of the distal bone is sometimes called for.

What can be said of corns?

These are of the hard and soft varieties.

Treatment:—The paring of the toe is usually employed and the application of silver nitrate or nitric acid. The salicylic acid preparation may be used. It is made up of salicylic acid, 1 drachm; collodion, 1 ounce, and cannabis indica, 8 grains. This is painted on the corn and the corn removed later on, when it has become disintegrated.

Describe ingrown nail.

This is rather an upgrowing of the pulp under the nail. It results from too narrow shoes, etc.

Treatment:—Pack. Use caustics to hasten granulations. Make a groove in the nail or a V-cut. Excision of the nail and matrix may be necessary. Cotting's operation.

What is onychia?

It is an inflammation of the matrix of a nail, and is commonly known as run-around. This is treated when stubborn, the upturning base of the nail keeping the inflammation up, by trimming the base of the nail and using iodoform packing.

Onychia maligna should be treated by the removal of the whole nail.

Describe the condition known as hammer toe.

This condition occurs in late childhood, especially boys. There is an abnormal flexion of the toe, causing joint to become prominent.

Cause:—Contraction of the plantar fibres of the lateral ligaments of the first inter-phalangeal joint.

Treatment:—Section of the ligaments and soft parts. This usually fails, hence amputation or excision of the joint is the best plan to follow.

What is Dupuytren's contraction?

It is a flexion of a finger or the fingers, usually of the ring and middle fingers, occurring in persons past middle life and usually in men. It involves the fascia and the digital prolongations and, later, the skin, but not the tendons. The cause is unknown. Rheumatism, gout, trauma or a nervous predisposition may have a part in its production.

Treatment:—Subcutaneous or open incision, with V-shaped flaps. and excision or free division of the contracted fascia, following with Thiersch's skin grafts.

Describe club-hand.

This is a congenital condition resulting from a defect in the osseous development, or from wounds with loss of substance, or it may be a paralytic or post-operative condition. The hand is usually flexed and drawn to the radial side.

Treatment:—1. Manipulation, followed by retention dressings. 2. Operation—Tenotomy. This is of no use and often does harm.

Give another name for webbed fingers and the treatment for the condition.

This is known as syndactylism. Diday's and Agnew's operations may be used. Skin grafts are also employed.

What is polydactylism?

It is a name for supernumerary digits and is a hereditary manifestation. There may be an extra little finger or toe or an extra thumb and big toe. These extra digits are usually imperfect.

Treatment:—Early amputation, unless the hand or foot is fully formed.

What is torticollis, or wry neck?

It is an abnormal position of the head produced by a contracted condition of one or more muscles of the neck. The sterno-cleido-mastoid is usually affected. The deeper muscles are also affected and become involved in long-standing cases. The posterior muscles are rarely involved.

Give the varieties, causes and symptoms of torticollis.

The varieties are the acute and chronic, occurring in all ages.

Causes:—Acute; result from cold or traumatism. The chronic are (a) spastic, the more common, occurring in children from nerve irritation, from habitual malpositions or from eye defects. Occasionally they occur from injury during birth or from vertebral deformity, i. e., con-

genital. It rarely occurs in adult life, (b) intermittent or spasmodic, affects the muscles innervated by the spinal accessory nerves.

Symptoms:—The head is turned to the opposite side. The chin is prominent and the muscle is tense, usually the sternal end especially. In old cases there is atrophy of the side of the face. There is usually no pain, and the deformity may be reduced, but recurs. Spinal caries may be excluded by the absence of bilateral rigidity, the character of the deformity, the absence of pain and the history.

Describe the treatment for torticollis.

1. Acute:—Belladonna. Rest. Local heat. Allow time to work on it.

2. Chronic:—A. Spastic.—This variety shows no tendency to get well alone. Mechanical apparatus, either before or after operation, should be used. These may be collars or braces or plaster bandage after forcible manipulation and reduction. Such treatment cures the milder cases. When the contraction is marked, the tendon and adjacent fascia must be divided either subcutaneously or by an open incision. The sternal or clavicular portions may be cut, or both.

B. The spasmodic variety may disappear of itself. It may be treated by baths, massage, electricity, friction, tonics and the indicated remedy. Change of air may be beneficial. They may require stretching. Division or excision of the spinal accessory nerve may be resorted to.

Operation:—Make the incision along the posterior edge of the sterno-cleido-mastoid muscle at its middle, or along its anterior edge from the mastoid process. Draw the muscle aside and raise and resect the nerve. The prognosis even after these operations is not brilliant. If the posterior muscles are affected, section of one, two, or three of the posterior cervical nerves may be tried.

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SPECIAL AND REGIONAL SURGERY.

SURGICAL DISEASES AND INJURIES OF THE HEAD.

Mention some general considerations in connection with surgery of the head.

The brain is particularly well protected against injury by, first, the thick, tough scalp; then the skull, made up of arches, which are particularly strong front and back, in the middle line and on either side of each temporal fossa, and consisting of two plates with an intervening pad or diploe. The brain is further protected by the stout dura and padded by the other membranes and the cerebro-spinal fluid. The lateral regions have, besides, a muscular cushion.

Is the skull elastic; if so, how can you demonstrate it?

The elasticity is best demonstrated by filling the skull with paraffin and dropping it at a moderate height. A dent will be found in the paraffin.

Where is the skull unusually thin?

At roof of orbits and nose; on either side of median line of occipital bone. It is weak at its base because of the many perforations for vessels and nerves, its complex make-up and its scant diploe. It is, however, protected by the muscles of the neck and by the face.

Where is the skull unusually thick?

Mastoid process; occipital protuberance; frontal sinuses.

CONTUSIONS OF THE SCALP.

How are contusions of the scalp classified?

As subcutaneous, subaponeurotic and subperiosteal.

Describe subcutaneous contusions of the scalp and give their treatment.

These are the mild cases. The effusion is limited because of the dense structure and the firm attachment between the skin and aponeurosis of the occipito-frontalis (the galea). They may produce extensive discolorations.

Treatment:—In the majority of cases pressure and cold applications (with or without arnica) will be sufficient. To prevent discoloration and absorption an incision may be made.

What points should be remembered in subaponeurotic contusions of the scalp?

1. The attachment of the aponeurosis. They spread widely over the head.

2. That they often give the impression of a depressed fracture on account of their "crater-like" feeling.

3. They may deceive by pulsating quite distinctly.

Give the treatment for subaponeurotic contusions.

Pressure with a snug muslin, or even elastic bandage, in addition to cold applications (ice bag or cold arnica lotion). This will probably cause absorption. If the injured part is covered with hair, so it will not be seen afterwards, an incision may be made, the blood clot removed and the cavity packed with gauze.

Where are subperiosteal contusions most frequently found, and what are they called? Describe them.

In the new-born. They are called cephalhematomata.

The caput succedaneum consists of a serous effusion in the above two varieties. These subperiosteal hematomata are apt to be confined to one bone due to the periosteal attachments being firmer at the sutures. Pulsation and the crater-like feeling are present in this variety.

In what region of the scalp are they usually found, and how are they treated?

Over the parietal bones. Occasionally only over the occipital bone. They are treated as the above.

What important points should be remembered in connection with scalp wounds.

1. Superficial wounds do not gape and rarely require suture, owing to the dense tissue and close attachment of the skin to the aponeurosis.
2. Wounds dividing the aponeurosis are apt to separate widely, and must be closed.
3. Infection under the aponeurosis will be followed by extensive burrowing of pus, limited to the eyebrows, zygoma and superior curved line of the occiput.
4. Danger of erysipelas is wholly due to dirty wounds.
5. Haemorrhage from the dense scalp is hard to control.
6. The scalp being extremely vascular, large portions may be torn off and hang, but if connected by a ped'cle they may be replaced, sutured and healing by first intention secured if the condition be aseptic.
7. Find out the condition of the skull, opening all wounds to the fullest extent.

How are wounds divided according to their shape?

As incised, lacerated and contused. Remember that a clean-cut wound may be produced by a blow from a blunt body.

How is haemorrhage of the scalp controlled?

By pressure, either direct or by sutures; the suture is thrown around the bleeding points. This suture is known among the Germans as Umstechen (stick around).

Give the treatment for scalp wounds.

Shave for a considerable distance around the wound; then scrub the whole with brush and soap. This is followed by a second scrub with a 20 per cent. carbolic solution, or ether, alcohol or fat, and the wound covered with a bichloride towel. If ragged edges exist, trim them off. If the wound is of considerable length, cut down to the bone to see if it is fractured. For suturing, use silkworm gut. The stitches should pass through the entire thickness of the scalp. One part of the wound must be left open for drainage, for which use iodoform gauze. The wound is then dressed airtight, using sterilized gauze dipped in a solution of bichloride of mercury, 1—3000; and a bandage applied. The latter is best held in position by adhesive strips. After forty-eight hours the wound is redressed and drainage removed.

What are the results of poor healing of scalp wounds?

Neuralgias from pressure on cicatrices. Epilepsy.

Mention some of the forms of suppurative inflammation of the scalp and give the causes.

Chronic, cold or localized abscesses, with a general furunculosis or with eczema, as a sequel of typhoid fever, of contusions, or from extension of neck carbuncles in syphilitic or tubercular and marasmic patients. The most important cause is infection, following dirty wound treatment. These inflammations are apt to assume the type of phlegmonous erysipelas or diffuse cellulitis. They usually spread under the aponeurosis, causing sloughing, necrosis, intercranial sepsis through the emissary veins, fever, delirium, pyemia, exhaustion and death.

What are the symptoms of suppurative inflammations ending as above described?

Headache, local pain, throbbing, with some swelling, red blush, rise of temperature and occasionally a rigor. Oedema of the lids may be the first sign.

What is the treatment for such conditions?

If wound is closed by sutures, take them out at once; use peroxide of hydrogen, followed by irrigation with bichloride of mercury. Then pack loosely with iodoform gauze, and dress airtight. Some absorbent cotton or gauze should be used to catch the discharge. Watch the temperature. Give nourishing and stimulating diet.

What remedies are mostly indicated in this condition?

Hepar, arsenicum, rhus tox, belladonna, sulphur, baptisia, bryonia and mercury.

Describe erysipelas of the scalp.

This disease is common here because of liability to infection from hair, dirt, etc. It is apt to suppurate and produce cellulitis.

The cutaneous variety is usually an extension from a similar process in the face or neck. It is a dangerous condition in alcoholics. It may be associated with meningeal inflammation, general sepsis and pyemia.

Treatment:—Protect with iodine or carbolic dressings.

Remedies:—Arnica in the first stage, arsenicum in severe constitutional prostration; china, silicia, secale for septic states with unhealthiness of the tissues.

Describe sypnlis of the scalp.

Secondary eruptions of syphilis are common, the favorite location being along the hair border on the forehead, known as the corona veneris. Tertiary manifestations as gummata are also found here and at the posterior hair line. Secondary and tertiary alopecias are also found.

The treatment is that of syphilis in general.

Differentiate between emphysema of the scalp and pneumatoceles.

Emphysema is produced by the entrance of air from a fractured sinus into the loose connective tissue of the nose and its tributaries or the mastoid.

Pneumatoceles are produced by the absorption of the osseous tissue or defects of bone. They can be reduced by pressure, and may be enlarged by sneezing, coughing, etc. They are elastic and resonant.

Give the treatment of pneumatoceles.

Puncture and follow by firm pressure, or incise and pack. Irrigating fluids have also been used.

TUMORS OF THE SCALP.

What is a wen?
It is a sebaceous tumor or cyst, caused by retention of sebum.

Give treatment for wens.
Make a complete incision. If it be ruptured, dissect out the whole sac, or curette; otherwise they are apt to recur. Where scar will not show, the cavity may be packed. When on visible part, it should be carefully sutured.

Describe dermoid cysts of the scalp.
These are congenital and contain, as elsewhere, hairs and sebaceous matters; they are found at the lines of union, the outer angle of the orbit and the root of the nose. They are usually small, but grow rapidly or as quickly shrink or inflame. They are not, like herniae, influenced by pressure, external or intracranial and fluctuate very faintly.
If irritated or growing or a source of annoyance they should be carefully dissected out.

What part of the head is most frequently affected with cancer? Give treatment.
The forehead.
Treatment:—Early and thorough excision is required. See that all lymphatic nodes are removed, as the parotid, mastoid and occipital glands may be infected from the scalp and the submaxillary glands from the forehead.

Describe sarcomata of the scalp.
Sarcomata frequently follow periosteal involvement as a secondary condition. They should be treated by excision.

What other tumors are found in the head?
Chondromata and osteomata spring from the periosteum of the bone. Lipomata are rare. Fibromata may occur as minute "fibroma molluscum" on the eyelids or ears, or as elephantiasis.
The only treatment is excision.

VASCULAR GROWTHS OF THE SCALP.

Describe aneurism of the scalp and give its treatment.
Simple aneurisms are usually met with in the temporal arteries and are of traumatic origin. If attached to the skin they may rupture spontaneously and resemble abscess.
Treatment:—Use the method of Antyllus. Ligate above and below. Then excision and evacuation can be easily done. Compression rarely effects a cure.

Describe cirsoid aneurism.
Cirsoid aneurism, arterial varix, varicose aneurism, racemose aneurism occurs usually in the temporal, posterior auricular and occipital arteries. The branches of the artery, and often its capillaries, veins and anastomoses are dilated and pouched. Occasionally an arterio-venous aneurism, or a communication between an artery and a vein, takes place or an aneurism by anastomosis.
It is usually found between the ages of twenty and thirty, and puberty and pregnancy seem to accelerate the growth.
It often results from naevus or traumatism.
Treatment:—This is dangerous, requiring a cool head. A preliminary ligation of the carotid facilitates the operation and lessens the danger. Borwell's method is as follows: Encircle the artery subcutaneously with a needle holding silver wire, emerging at different points in the skin

and entering the same openings till the artery is surrounded. Draw the wire tighter day by day until the loop comes away.

Coagulating injections of alcohol or iron chloride and galvano-puncture have been used.

What is a nevus or mother's mark?

Nevus is a port wine stain made up of fine capillaries, and is not elevated above the skin. It is congenital and doesn't grow. The diagnosis is self-evident.

Treatment:—Excision and suture or grafting, multiple scarification and electrolysis have been used. Treatment is not very satisfactory, especially if the stain be large.

Describe and give the treatment of strawberry tumor.

This is made of large capillaries and projects above the skin. It is congenital or appears soon after birth. It grows steadily and may rupture, producing serious haemorrhage.

Treatment:—Remove early by excision or the subcutaneous ligature. Excision is preferable, leaving a less unsightly scar. The knife should be kept just outside the growth. The defect can be closed by suture or Thiersch's skin grafts.

Describe venous tumors.

These are varices in the frontal or temporal regions and should be treated by excision when they threaten to rupture.

A sacculation of venous blood may be found between the periosteum and the skull from injury to emissary veins. Hence they communicate with a sinus. Bone depression and absorption is also present.

These tumors have no pulsation or bruit and are reducible by pressure.

Treatment:—They should be left alone, as dangerous haemorrhage follows excision.

DISEASES OF THE SKULL.

What is the condition of atrophy of the skull?

The bones become thin and even perforated. Both tables of the skull are usually affected, although the atrophy may be confined to the outer. It may be general or local and usually occurs in old people as a softening of the bone, the compact bone being most affected. Protection from injury is about all that can be done.

When localized atrophy is due to pressure from tumors, Pacchionian granulations, vessels intracranial tension—as from hydrocephalus. Craniotabes, the form more frequently met with in early life is ascribed by some to hereditary syphilis, by more to rickets. The skull has a parchment-like feel, while from pressure in the recumbent position the back part of the head becomes flattened. The convolutions may be marked on the bone. The closure of the fontanelles is slow.

Treatment:—Treat as in rickets, unless there are other symptoms pointing to hereditary syphilis. Protect from falls, blows, etc.

Describe hypertrophy of the skull.

Occasionally a true hypertrophy is met with. Both tables and the diploe are affected, but usually the tables become condensed and ivory-like at the expense of the diploe. Syphilis and osteitis deformans are the supposed causes of the latter form, which is known as hyperostosis.

As the condition cannot be recognized during life, it cannot be treated.

What are aplasia cranii and leontiasis?

Aplasia cranii is an incomplete formation of the skull, and leontiasis is an abnormal thickening of the facial and cranial bones.

What inflammations occur in the skull?

Periostitis and osteitis, as elsewhere, often with resulting caries or necrosis.

Describe periostitis.

It is a condition resulting from a trauma, dirty wounds, from infection from within, as in subperiosteal mastoid abscess or as a sequel to typhoid and other infectious diseases. The chronic form is apt to be syphilitic—a gumma—which is liable to involve the underlying bone. A form of syphilitic periostitis is met with which tends to ossify, forming nodes.

Treatment:—This depends on the cause. Anti-syphilitic remedies. Incision, curetting, disinfection and general and local anti-tubercular treatment.

What can be said of osteitis of the skull:

The acute form usually follows infected injuries and results in an osteomyelitis. Venous thrombosis from this source is not uncommon; the clots, loosening and breaking down, are carried into and infect the sinuses, or as metastatic emboli produce a pyemia. Necrosis follows. The chronic form rarely results from traumatism, but more frequently syphilis is the exciting cause. The outer plate or the whole thickness may come away by a rarifying osteitis.

Treatment:—It is hard to distinguish osteomyelitis from suppurative periostitis or phlegmon of the scalp. An early incision is demanded, however, in all three. It should be free. Remove the inflamed bone to expose the diploe. Scrape away all diseased tissue and disinfect thoroughly with carbolic acid and sublimate. The chronic form requires less haste. When indicated anti-syphilitic treatment accomplishes much. Frequent dressings are necessary, as the odor is very disagreeable.

Give a description of osteomata of the skull.

They are characterized by slow growth. They are known as exostoses when external, and enostoses when internal, or when springing from the diploe. Their position is between tumors, hypertrophy and inflammatory growths. The exostoses are more compact than cancellous, and are globular, with a broad base and occasionally grow to a large size. Most frequently they are met with in the orbit, the roof of the nose or frontal sinus, the vault and the base. The enostoses usually spring from the inner plate or the dura, and are inflammatory, from injury or chronic inflammation. They are found in pregnant women and alcoholics.

Treatment:—If accessible, they should be removed from the sinus, nose or orbit. With pressure symptoms localizing them, they may be trephined and removed with the bone. If unsightly and on the vault, remove.

What are the characteristics of sarcomata found in the skull, and what their treatment?

Sarcomata grow outward when springing from the pericranium, and rarely involve the underlying bone. They may attain great size. Most frequently originating in the diploe, they spread the tables apart, break through and spread under the scalp or compress the dura and brain. Those growing from the dura usually spread inward, but they may cause absorption of the bone by pressure outward. They are oftenest of the spindle-celled variety, occasionally giant-celled, and there are usually degenerations.

Symptoms:—Egg-shell crackling, brain symptoms. Those springing from the dura are reducible and the opening of exit may be felt. Pulsation will also be felt. There may result special nerve symptoms from pressure.

Treatment:—Early and complete excision. The dangers are shock, hernia cerebri and recurrence. Operate in several tempos.

Wens are freely movable and fluctuate.

Describe microcephalus.

This is a condition of small head, associated with idiocy, imbecility and other signs or intra-cranial defect, irritation or pressure.

Causes:—Various opinions. Some say that it is due to a premature union of the sutures; others that a small skull is more frequently the cause. However, the cause is probably intra-cranial, the small skull being the result. These changes come from injuries, causing inflammation or hemorrhage, blood vessel disease, imperfect cerebral development, etc. Pulsation on removal of bone indicates pressure.

Treatment:—The primary results of an operation have been brilliant, but improvement soon ceases if nothing further is done for the future development of the child. The great danger is shock.

Operation:—Craniotomy, or craniectomy, removing strips or pieces of bone to relieve pressure. When microcephalus is symmetrical, two strips of bone are removed from above the frontal sinuses to the tentorium on either side of the middle line. The skull is opened with a trephine and the bone bitten away with rongeur forceps. An aseptic wound is absolutely essential. A T-incision or an H-incision may be made.

What is a prolapsus cerebri?

A condition found after incision through the scalp, skull and membranes, when the wound has not united by first intention. It is called a fungus cerebri. The brain is usually incised and sepsis follows.

Give its general appearance.

It appears like a large dirty brown mass with a suppurative abscess and a disagreeable odor. It is more liable to escape through small openings than through large ones. It is usually found on the vault and sides of the head. The protrusion consists largely of granulation tissue, edematous from constriction. It discharges pus, bleeds easily and pulsates. They grow rapidly at first, then stand still. They may grow to the size of a fist, or shrivel up, cicatrize and leave a marked depression. The danger is from brain sepsis.

Give the treatment for prolapsus cerebri.

It is not advisable to amputate it because of its liability to recur. By protection from infection with antiseptic solutions for weeks, the part will shrivel up and leave a depression. It is important to see that the wounds heal by first intention, so that prolapsus cerebri will not occur again. Cicatrization may be encouraged by skin grafting.

What are cephaloceles?

They are herniae cerebri of congenital origin, and may appear at portions of the skull corresponding to the different ventricles.

Where are cephaloceles most frequently found?

At the occiput, and therefore known as occipital cephaloceles, corresponding to the fourth ventricle.

What are sincipital cephaloceles?

They are those found at the root of the nose to either side of the median line. They correspond to the anterior cornua of the lateral ventricles.

Where else are cephaloceles found?

Posterior to the mastoid, corresponding to the posterior cornua of the lateral ventricles. At the roof of the pharynx, corresponding to the third ventricle. These forms are rarely found.

How many varieties of cephaloceles are there, according to their contents?

Three, viz.:

1. Meningoceles, those containing the meninges and some fluid.
2. Encephaloceles, those containing the membranes and some brain substance.
3. Hydrencephaloceles, those containing membranes and brain substance, the latter holding fluid communication with one of the ventricles.

Give the diagnosis of cephaloceles in general.

They are found in the very young, and are often accompanied by other errors of development. If attempt is made to reduce these herniae, intercranial tension is increased with pressure symptoms.

Differentiate between Meningoceles, Encephaloceles and Hydrencephaloceles.

Meningoceles have translucency and fluctuation; they are reducible as a rule, and are liable to be sincipital. They are non-pulsatile.

Encephaloceles do not transmit light, are non-fluctuating, are more liable to be on the forehead, and often resemble congenital vascular growths. They are small and sessile and pulsating.

Hydrencephaloceles are generally large, fluctuating and slightly translucent, having a lobulated feeling. They cannot be reduced, and are associated with imperfect development of the head.

Prognosis:—Hydrencephaloceles are not amenable to treatment; the child dies. The other two forms hold out more hope, especially if small, They may cure themselves, therefore protect.

Give the treatment for cephaloceles

Prevent rupture by protecting them with antiseptic dressings. Some operators have excised them with good results; but antiseptic tapping followed by compression has been proven safer.

Describe acute hydrocephalus.

Acute dropsy of the brain, usually results from a meningitis, and is usually tubercular in origin. There is an accumulation of fluid, extra or intra-ventricular.

Symptoms:—Headache, fever, stupor or delirium, pressure symptoms, causing strabismus, rigid muscles of the neck, twitching of muscles, the hydrocephalic cry; later paresis or paralysis and optic neuritis.

Surgical treatment:—Tapping the ventricles has given but one success (non-tubercular).

Medical treatment:—This is the usual form. The disease is usually fatal.

Mention the characteristics of chronic hydrocephalus.

This variety is usually congenital or comes on soon after birth.

Symptoms:—Enlarged cranium, separation of the bones, prominent forehead, giving the characteristic expression. Patient slow to walk or talk, poor sight and intelligence. Convulsions often. There is an enormous distension of the ventricles.

Treatment:—Usually unsuccessful.

1. Tapping (one side of middle line) through the enlarged fontanelle. Do not remove more than two or three ounces. Make pressure during the operation and afterward.
2. Tapping the lateral ventricles after ossification, from one and a half inches above and behind one meatus to two and a half to three inches above the opposite meatus.
3. Tapping the cord.
4. Tapping through the occiput.

FRACTURES OF THE SKULL.

Why are fractures considered under injuries of the head?
Because they owe their importance to the coincident or resulting injuries to the brain.

What kind of union results if there is loss of substance?
Fibrous union.

What is the percentage of skull fractures as compared with other fractures?
About two per cent.

Name the different fractures of the skull.
Fissured, comminuted, depressed, punctured, complete, incomplete, simple, compound, fractures of base or vault, fractures of the new born.

Give descriptions of fissured and comminuted fractures.
A fissured fracture is simply a crack of the bone. The crack may be simple or multiple, and may be limited or extend all around the skull. Sometimes the crack involves the outer table of the skull only, but frequently it goes through both plates. The inner plate is glass-like, and is, therefore, more easily splintered.
A comminuted fracture is one in which the bone is broken in several places. The splinters of the inner table may stick into the dura mater or may even puncture the brain.

Give descriptions of depressed and punctured fractures.
In a depressed fracture, not only is the bone broken in several places, but it also presses upon the contents of the skull. Patients can stand such a pressure much more readily than that produced by a blood clot or inflammatory products, but the remote effects are disastrous.
A punctured fracture is made by any sharp instrument (pointed). We call it a penetrating fracture when the instrument goes through the tables of the skull, and perhaps into the brain substance. We call it a perforating fracture when the instrument goes in on one side of the skull, through the brain, and comes out through the other side of the skull. This kind of fracture is generally the result of a gunshot wound.

What are complete and incomplete fractures?
A complete fracture is one which goes through both tables of the skull. An incomplete fracture generally involves the outer table only, rarely the inner table alone. The latter are more important, because near the brain, and because they are often overlooked.

Give another classification of skull fractures.
Simple, those not communicating with the exterior; compound, communicating with the exterior through lacerations of the integument or through the air passages.

Give examples of fractures that seem to be simple, though compound.
Fractures of the mastoid and of the frontal sinuses. The skin may not be broken, but the air goes into the cavity through the auditory canal, or the Eustachian tube in the former case, and through the nose in the latter; and septicaemia may result.

Where are fractures of the base most frequently found?
In the middle fossa of the skull.

Where are fractures of the base rarest and most dangerous?
At the posterior fossa.

What frequently produces fractures in the new born, and what is the result?

The forceps in delivery. Death often results, or paralysis of certain parts, or other brain lesions. They should be carefully watched and if the depression does not disappear, the piece should be elevated.

Give causes of fractures of the skull and mention some examples.

Fractures may be produced by direct violence, that is, a blow may produce a fracture of the very part which it struck; or, by indirect violence, as when through a fall or blow upon the chin, the condyles of the mandible are driven into the auditory canal or even into the skull. For another example, an umbrella or cane may be driven into the cranial cavity through the roof of the orbit.

A circumscribed force spends itself at the place which it strikes.

A diffuse force involves a larger area, and is apt to produce a radiating fracture.

Multiple forces produce fractures through more than one blow. Example:—The first blow might be produced by a person falling in the street, and a second blow be produced by a horse or wagon running over him.

What is a counter-stroke, or "contre coup?"

A blow which produces an injury of a part on one side while the force of the blow was directly opposite. Laceration of the brain or rupture of the meningeal artery is the usual lesion resulting from a counter-stroke on the skull.

Give the most important diagnostic symptoms of skull fractures in general.

In open (compound) fractures we are usually able to see the fracture or make it out with a probe. Hammering on the skull (percussion) to elicit sounds has been recommended. It gives cracked-pot sounds, but is very unreliable. Accumulation of fluid is usually an important symptom, and if the scalp be open we have the escape of cerebro-spinal fluid mixed with the blood. Escape of air under the scalp. Loss of vision. The most important are the brain symptoms, which manifest themselves either in excitement, delirium or in depression of sensation, of motion, or of special senses (photophobia, deafness, etc.).

There is also localized pain and tenderness, probably from contusion of the scalp.

Give some symptoms that would indicate a fracture of a certain portion or part.

Persistent flow of cerebro-spinal fluid through the nose or the ear would indicate a fracture of the base of the skull.

Exophthalmus (protrusion of the eyeball), due to severe conjunctival hemorrhage, would indicate a fracture in the posterior fossa.

Ecchymoses, especially of the lids, or under the conjunctiva, showing probable laceration of the ophthalmic artery, etc.

Paralysis of certain parts, as the arm or leg, would indicate fractures over their respective centers.

Mention three great dangers in fractures of the skull.

Septic infection. Pressure upon the brain. Irritation.

How does septic inflammation act?

It may act rapidly and kill in a few hours. Septic infection, such as meningitis, may spread and cause encephalitis. It may take a slow course and brain abscess be developed after a month or so; or, septic inflammation of the bone (osteomyelitis) may result.

How may pressure act?

It may act in three ways:—

The fractured bone may press upon the brain. This is not very dangerous.

Pressure may be produced by a blood clot, and here the symptoms show earlier and are more dangerous.

Pressure may set up inflammatory effusion within 36 or 48 hours.

How may irritation result in skull fractures?

Irritation may result from any foreign substance in the brain, even the ragged edges of a wound of the brain, or a piece of factured bone, etc. This may be followed by headaches, epilepsy and insanity. The longer the irritant remains, the less is the liability (certainty) of curing the patient.

What are the general key notes in the treatment of skull fractures?

An early operation and an aseptic wound.

What skull fractures always call for early operation?

All fractures of the skull indicated by pressure and the persistence of the brain symptoms.

What is the guide concerning the part to be operated?

The wound usually, but if brain symptoms should clearly indicate a different part, we would consider the latter the more important.

Give the reasons why nearly all skull fractures call for the trephine operation?

All fractures that can be diagnosed call for operation.

Compound depressed fractures, because of pressure on the brain.

Compound comminuted fractures, because of the danger of their pressing on the brain, or that a fragment may have entered the membranes or the brain substance.

Simple and closed, and simple and open, because of the danger of irritation.

Fissured fractures, because they are apt to contain pieces of dirt (which may have escaped detection), which set up irritation.

Closed fissured fracture, when it can be diagnosed, because of the splintering of the inner table.

Incomplete fractures should be chiseled to ascertain whether the outer table only is involved.

Give the general management of patients with skull fractures, previous to the operation.

Keep the patient quiet. Permit of no excitement whatever, no conversation, no noises, no strong lights, no odors. Place patient in bed, with head slightly elevated. Keep the bowels open, as this is supposed to relieve cerebral congestions. Watch the bladder. If there be retention of urine, use an aseptic catheter. Frequent attempts to urinate may mean a retention of urine. Apply cold to the head occasionally. Give liquid diet only. Keep any avenues of infection absolutely clean by antiseptic solutions.

Give the medicinal treatment for such cases.

If stimulants are needed, ammonia is preferable to alcohol, as alcohol may produce cerebral hyperaemia. As to anodynes, the bromides are better than morphia.

The most frequently indicated remedies are:—Arnica, Belladonna, Gelsemium, Hyoscyamus, Opium and Stramonium.

CRANIAL TOPOGRAPHY.

Mention the four principal sutures of the skull.

The coronal or fronto-parietal, the sagittal or inter-parietal, the lambdoidal or occipito-parietal, and the squamous or squamo-parietal.

Name some other important sutures.

Spheno-frontal, spheno-parietal, spheno-squamosal, petro-mastoidal, petro-squamosal, masto-occipital, masto-parietal, squamo-mastoidal.

Give names and location of the important bony landmarks of the skull.

Glabella:—The smooth prominence over the root of the nose, between the eyebrows.

Inion:—The external occipital protuberance.

External angular processes:—On frontal bone.

Parietal eminences:—Most prominent parts of the parietal bones.

Pterion:—The junction of the frontal, sphenoid, squamous and parietal bones, forming an H or K.

Bregma:—The point at which the sagittal meets the coronal suture.

Lambda:—The point at which the sagittal meets the lambdoidal suture.

Center of external auditory meatus and its roof:—External entrance to ear.

Asterion:—The junction of the parietal, mastoid and occipital bones.

Parieto-squamo-mastoid junction:—A point just anterior to the asterion.

Stephanion:—The point where the temporal ridge meets the frontal suture.

Roof of the external auditory meatus.

What is the base line of Reid?

It is a line drawn from the lower margin of the orbit through the center of the external auditory meatus, to just below the Inion.

What is the use of this line?

As its name suggests, it is the base of other lines. Lines are drawn parallel or at right angles to it.

What is the binauric line?

A line drawn from the center of one external auditory meatus over the vertex at right angles to Reid's base line to the center of the other external auditory meatus.

CONTENTS OF THE SKULL.

What two purposes does the dura mater serve?

It serves as an internal periosteum for the skull and as a covering for the brain.

the cerebrum, the cerebellum, the pons Varolii and the medulla ob-

With what is the dura mater lined internally?

Endothelium.

Where is the sub-dural space?

Between the internal layer of the dura and the external layer of the arachnoid.

Where is the sub-arachnoid space?

Between the arachnoid and the pia mater. It is much larger at the base of the skull and contains cerebro-spinal fluid. It communicates with the general ventricular cavity and the spinal cord.

Give the characteristics of the pia mater.

It is a very vascular membrane, dipping down into all the spaces, fissures, and sulci, and forming the velum interpositum and the choroid plexus of the fourth ventricle.

What is the encephalon?

It comprises the membranes with their potential and actual cavities, longata.

Describe the encephalon briefly.

The cerebrum is composed of two hemispheres, connected by the corpus callosum. The cortex of the brain is composed of grey matter, and is divided into lobes, lobules, convolutions and fissures. The interior of the brain or the centrum ovale is composed of white matter in the shape of projection, association and commissural fibres. The projection fibres carry motor and sensory impulses from the cortex to the base of the brain and the spinal cord. The association fibres join different portions of the cortex with each other. The commissural fibres unite the lateral halves of the brain.

The basal ganglia are the corpora striata, the optic thalami and the corpora quadrigemina and geniculata. These are masses of grey matter the functions of which are not very well understood.

The corpora striata consist of two masses of grey matter, the caudate and lenticular nuclei, separated by a band of white matter, the internal capsule. This capsule has anterior and posterior limbs, and contains projection fibres. Unless it is involved, lesions of the basal ganglia are not recognized. The anterior limb contains fibres from the frontal lobe and its functions and lesions are not, therefore, understood. The fibres of the posterior limb come from the motor area and occipital lobe. Hence, lesions will produce hemiplegia of the opposite side, or paralysis of the lower face, arm or leg, hemianopsia, one-sided sensory disturbances and speech defects.

The crura cerebri, pons and medulla also contain projection fibres and nuclei of the cranial nerves, consequently palsies of these nerves, as well as motor and sensory disturbances will be produced by their lesions.

The cerebellum controls the equilibrium of the body. Lesions of its middle lobe will cause vertigo and a gait like that of a drunken man, from inco-ordination.

THE FISSURES, LOBES, LOBULES AND CONVOLUTIONS OF THE BRAIN.

What are the five principal fissures of the brain?

1. Longitudinal, separating the hemispheres.
2. Fissure of Bichat, separating the cerebellum from the cerebrum.
3. Fissure of Sylvius, which begins at the base of the brain, between the frontal and temporo-sphenoidal lobes, near the anterior perforated space; one limb going horizontally backward, and the other (much smaller) passing toward the logitudinal fissure.
4. Fissure of Rolando, which begins at a point one-half inch behind the middle of the distance from the glabella to the inion, and runs downward and forward at an angle of 67½ degrees for three and three-eighths inches.
5. Parieto-occipital fissure, which appears like a notch on the margin of the cerebrum. It commences about midway between the fissure of Rolando and the posterior extremity of the brain, and runs downward and forward till it meets the Calcarine fissure.

Describe the Calcarine and Calloso-marginal fissures.

The calcarine fissure takes its origin from the anterior or lower end of the parieto-occipital fissure and runs backwards and slightly downwards. In front of the parieto-occipital fissure is the precuneus.

The calloso-marginal fissure starts behind the fissure of Rolando and runs downward and forward, curving around in front of the corpus callosum.

What is the Operculum?

It is the space formed around the lower part of the fissure of Rolando, and between it (within the angle) and the fissure of Sylvius.

Where is the Cuneus?

It is the triangle formed by the parieto-occipital and calcarine fissures and the margin of the brain.

Name the different lobes of the cerebrum and give their location.

Frontal lobes, lying anterior to the fissure of Rolando.

Parietal lobes, lying between the Rolandic, Sylvian and parieto-occipital fissures.

Occipital lobes, lying behind the Sylvian and parieto-occipital fissures.

Temporo-sphenoidal lobes, lying below the fissure of Sylvius.

Name the lobules of the cerebrum.

The paracentral, the praecuneus, the cuneus, and the superior and inferior parietal.

Name some of the most important convolutions.

The ascending frontal and ascending parietal, anterior and posterior to the fissure of Rolando; often called the prae and post-Rolaudic convolutions. Their continuation in front of and above the calloso-marginal fissure, forms the paracentral lobule. In front of the ascending frontal convolution is the pre-central sulcus, which separates the pre-Rolandic from the frontal convolutions. Then we have the first, second and third frontal convolutions. Behind the post-Rolandic is the intra-parietal sulcus.

The two or three temporo-sphenoidal convolutions run parallel with and below the fissure of Sylvius. They are numbered from above downward.

The supra-marginal convolution lies below the intra-parietal sulcus, between its beginning and the posterior limb of the fissure of Sylvius.

The angular gyrus lies below the posterior border of the intra-parietal and behind the superior extremity of the horizontal limb of the fissure of Sylvius.

Above the calloso-marginal fissure, is the calloso-marginal convolution, and below it we have the gyrus fornicatus, better known as the convolution of the corpus callosum.

The gyrus hippocampi extends into the temporo-sphenoidal lobe. Beyond the latter is the uncinate or hooked convolution, and below the calcarine fissure we have the lingual gyrus.

RELATIONS OF LANDMARKS TO THE CONTENTS.

Where is the longitudinal sinus and fissure?

In right-handed people, to the right of the sagittal suture; in left-handed people, to the left side.

Locate the fissure of Bichat and the tentorium cerebelli.

They correspond to a line drawn from the Inion to either external auditory meatus.

How can you locate the fissure of Rolando?

Draw a line from the Glabella to the Inion (55.7 per cent. of this distance backward would correspond to a point one-half inch behind the center). From this line draw another of 67.5 degrees and we have

the exact location. It runs downward for three and three-eighths inches.

If the distance from the glabella to the inion is	The distance from the glabella to the upper end of the Rolandic fissure will be
11 inches.	6.1 inches.
11.5 "	6.4 "
12 "	6.6 "
12.5 "	7.0
13 "	7.2 "

What instrument is frequently used for measuring this fissure?
The cyrtometer.

What simple method can be used to point out this angle of 67½ degrees?

The method of Chiene:

Take a paper of 90 degrees and fold diagonally. One-half of this is again folded. The first folding gives an angle of 45 degrees and the second an angle of 22½ degrees, which added to the 45 degrees gives the required 67½ degrees. Oiled silk is better than paper, as it can be sterilized before using.

How do we locate the fissure of Sylvius?

Take two points, one an inch and a quarter posterior to the external angular process parallel to Reid's base line, and the other three-quarters of an inch below the parietal eminence. Draw a line between these two points and it will correspond with the horizontal limb of the fissure. At a point three-quarters of an inch along this line we have the origin of the vertical limb. The point of bifurcation is below the pterion. The vertical limb takes the same course as the squamo-sphenoidal suture.

How is the parieto-occipital fissure located?

Prolong the line representing the horizontal limb of the Sylvian fissure to the sagittal suture and this point is the location of the parieto-occipital fissure. It is midway between the upper end of the fissure of Rolando and the fissure of Bichat, appearing as a notch on the convexity of the brain.

Locate the lateral sinus.

A line from the inion to the asterion marks the first part of the groove; one from the asterion to the roof of the osseous meatus marks the sigmoid groove; and one from the parieto-squamo-mastoid junction to the tip of the mastoid process marks the remainder.

Locate the middle meningeal artery.

Draw a line from the external angular process, parallel to Reid's base line, and at a point one and a quarter inches posterior to the process, the anterior branch of this artery will be found. The posterior branch is at the same line, just below the parietal eminence.

THE AREAS OF THE BRAIN.

What constitute the motor areas?

The upper portion of first frontal; the pre- and post-Rolandic convolutions; the superior parietal and paracentral lobules.

How do these areas act?

The area on one side of the brain controls movements of the opposite side of the body. The leg, arm and face centers are located as follows:

They lie in the Rolandic area.

Leg center is above, with toes down, occupying the upper quarter. The arm center is next, starting with the shoulder above and ending with the fingers below, occupying the next half.

Face center is below, occupying one-quarter.

In each section there is a return to the normal order; e. g., in the arm area the shoulder center is above; then the arm, elbow, fore-arm, wrist, fingers and thumb centers. In the leg area the hip center is above, then the thigh, knee, leg, ankle, great toe and other toe centers. In the face area, the centers for the eye, brow and cheek are above and in front, those for the tongue and larynx below and in front, and those for the mouth, pharynx and platysma behind.

Where are the centers governing the trunk, head and eyes?

The centers for the trunk are thought to be on the median surface, anterior to the paracentral lobules, and the centers for the head and face are supposed to be in the second frontal convolution.

How do lesions of the motor areas act?

The destructive lesions produce paralysis; the irritative lesions, spasms. The former correspond strictly to the lesion; the latter may spread from lesion as a focus to parts controlled by adjacent centers.

If the arm area be injured, how can you differentiate whether the injury be in the cortex or in the white matter?

If there be a well defined, or limited, paralysis, or one part spreading gradually in order of adjacent parts; as, for instance, in the finger, we would say the cortex is injured; but if the paralysis were more general, it would probably be due to injury or disease of the white matter. The reason for this is that the grey substance is more spread out, one area overlapping another, while the white matter is more collected and in a smaller space.

Where is the speech center located?

In the third frontal convolution of the left side, in right-handed people. In left-handed people, vice versa. (It is also known as Broca's center).

How many kinds of speech centers are there?

Four, two sensory or receptive, and two motor or emissive. Of the two sensory, auditory speech, or the power of understanding articulate words, has its area in the posterior part of the first and perhaps second temporo-sphenoidal convolutions; that for visual speech, or the power of understanding written or printed language, is in the angular gyrus. Of the two motor, those with power of co-ordinating the muscles of phonation so as to articulate words, has its area in the base of the third frontal convolution and the adjacent portion of the pre-Rolandic (Broca's center); and that of written speech or the power of writing, originates in the same region and is connected with the arm center by association fibres.

What will lesions of the speech areas produce?

The different forms of aphasia (loss of speech of cerebral origin).

Aphemia or motor aphasia, and agraphia or the loss of power of writing from dictation or copying result from disturbances of the motor speech centers. The sensory aphasias are word deafness (inability to understand words heard), and alexia or word blindness.

Where is the visual area of the cortex?

In the cuneus, the convexity of the occipital lobe, and the angular gyrus.

Where are the primary visual centers?

Optic thalami, external geniculate and anterior quadrigeminal bodies, the optic tract, the optic chiasm and optic nerve.

What would be the result if the visual centers were injured?

Hemianopsia or half blindness on the opposite sides of both eyes.

Where is the sense of hearing located?

In the posterior portion of the first and second temporo-sphenoidal convolutions.

Where is the olfactory center located?

At the tip of the temporo-sphenoidal lobe in the uncinate convolution.

Where is the center for taste found?

In the lingual gyrus.

CONTUSION, COMPRESSION, AND HAEMORRHAGE OF THE BRAIN.

What does the term "concussion of the brain" mean?

It means a contusion or laceration of the brain.

What are the causes of brain contusion?

Functional shaking up, reflex vascular paralysis, bone impact at point of injury or at one opposite this; wave of cerebro-spinal fluid.

What lesions result in brain contusion?

Bruising and laceration of the brain; localized or general minute ecchymosis or thromboses, hemorrhages into the brain substance, ventricles or membranes.

Give four varieties of symptoms that are found in contusion.

Mild, severe, remote and cerebral irritability.

Give examples of mild and severe symptoms of contusion of the brain.

Mild:—A fall on the head, stunning the person and causing temporary unconsciousness, pallor, weak pulse, superficial breathing, muscular twitching (?). Reaction:—Vertigo, tinnitus, nausea, vomiting, weakness, on moving, stronger, faster pulse, flushed face and mental excitement, injury and subsequent events forgotten.

Severe:—The above symptoms intensified and lasting for days. Patient only aroused with difficulty, if at all; answers in monosyllables; pupils contracted (occasionally dilated and uneven), usually react to light; involuntary stools and urine, or at times retention. Reaction:—More marked, face flushed, pulse bounding, headache, photophobia, etc. Finally symptoms of inflammation appear.

Give examples of remote effects.

Brain abscess, epilepsy, insanity. Usually for weeks or months there are mental lassitude, headache, vertigo, irritability, leading to bursts of uncontrollable anger, which condition is worse from heat or alcohol.

Mention some conditions present in cerebral irritability.

Patient becomes angry and abusive when aroused, or refuses to respond; convulsive movements, involving limited areas from cortical irritation. Recovery slow.

Give treatment for contusions of the brain.

The first treatment should be for shock. Apply hot-water bottles (well protected) along the trunk and lower limbs and apply heat to

the epigastrium. Give belladonna. Surgical treatment:—Examination for wounds and bruises, hemorrhage from nose, ears, etc. Exploration from persistent symptoms or those from localized brain and skull symptoms.

What may be the cause of compression of the brain?

It may follow a contusion. A loose piece of bone, a blood clot, products of inflammation, brain abcesses or brain tumors.

What are the varieties and results of compression of the brain?

Varieties:—General, local, spreading, sudden, gradual. Results may be immediate, late or remote.

What are the symptoms of brain compression?

Unconsciousness, sometimes preceded by irritative symptoms, when compression is general. Pain, vomiting, convulsive movements and signs of increased blood pressure, i. e., flushed face, throbbing carotids, rapid pulse and contracted pupils, are present. When compression is well established there is deep coma, livid face, loss of motion and sensation, stertorous breathing, dilated, fixed pupils (worse on side of lesion), full, strong pulse (slow early), temperature low at first, rises rapidly; skin hot and moist (occasionally cold and clammy). Bowel and bladder paralyzed until overflow; involuntary stools.

When local, there are monoplegia, hemiplegia, spreading palsy, cranial nerve injuries.

Give the treatment and prognosis of brain compression.

Remove the cause, whether foreign body, bone, clot, effusion or tumor.

Prognosis:—Depends on proper treatment or not. Good antisepsis. Elevate the head, apply heat to feet, quiet, catharsis, attention to bladder to prevent distension.

Give the indicated remedy or that to contract the arteries.

Differentiate compression of the brain from some other conditions similar to it.

Opium poisoning: Pin-point pupils and the odor of laudanum; no paralysis. Later have widely-dilated pupils.

Uraemic convulsions; Oedema. Examine the urine.

Apoplexy: Examine the condition of the walls of the vessels; they are atheromatous in apoplexy; coma more profound. Otherwise the symptoms are similar to those of compression of the brain. Coma and paralysis appear.

Drunkenness: Temperature is subnormal; person is limp, but not paralyzed; pupils react to light. Odor is of no use, because any injured person may have received alcohol as a stimulant.

The best rule is to allow the patient to sober up in the accident ward.

Give the varieties of intracranial haemorrhage according to their location.

They may be between the dura and the bone (extra-dural), or under the dura or into or between the membranes (sub-dural), or into the substance of the brain and into the ventricles.

What is a frequent cause of extra-dural haemorrhage.

Fracture or counterstroke and rupture of the middle meningeal artery.

Mention the results of extra-dural haemorrhage.

Osteophytes, abscess, cysts, epilepsy and mental disturbance.

Give some symptoms of extra-dural haemorrhage.

It produces a typical picture of compression. The most characteristic symptom is an interval of lucidity between the time of the haemorrhage and the development of the compression (ten days, possibly). If there be paralysis, it is of a spreading character. Slow, hard, large pulse. Patient unconscious, coma, dilated fixed pupils (especially clot side), respiration slow and stertorous. Temperature rises as in all head injuries.

Give the treatment for extra-dural haemorrhage.

Localizing symptoms should be the first guide; in their absence, contusions, wounds or fractures of the side of the head. Remove the cause of the pressure. Trephine, first for the anterior, then for the posterior branch of the middle meningeal artery. The anterior branch is one inch and a quarter directly behind the external angular process. The posterior branch is at same level below the parietal eminence. If blood clot be found, remove carefully. Stop the arterial bleeding, either by a stitch and pressure with iodoform gauze, or by a clip catching the dura and the bone together.

What vessels are mostly found ruptured in sub-dural haemorrhage?

The middle cerebral artery or a number of smaller vessels.

Describe sub-dural haemorrhage.

It is a frequent concomitant of contusion of the brain or laceration or fracture. It is the not uncommon apoplexy of the new-born. If the middle cerebral is ruptured, the symptoms resemble those of the middle meningeal and should be treated as such. When the smaller vessels are ruptured, the haemorrhage spreads out into the sub-dural and sub-arachnoid spaces and sulei. Death usually follows; but if the patient survives there may be an absorption of the clot, giving rise to a meningitis, spreading sclerosis or break down into abscesses or form a cyst.

Give the symptoms of sub-dural haemorrhage.

They are gradual in onset and slow in course, those of mild cortical pressure with traumatic irritation, viz.: Restlessness, excitement and spasm. Vomiting, sleepiness and slow pulse; mono or hemiplegia, aphasia, loss of sensation, or hemianopsia. Stupor, stertorous breathing, rapid, irregular pulse, high temperature and uneven pupils.

Remote:—Headache, loss of memory, epilepsy, even dementia (worse than death).

Give the treatment for sub-dural haemorrhage.

That for head injuries in general. In view of results, any scalp, skull or brain symptoms should be followed.

Describe haemorhage into the brain substance.

This is ordinary apoplexy with a traumatic cause. The deep coma usually obscures all localizing symptoms.

Treatment:—If not rapidly fatal, the clot has been evacuated and the carotid has been tied (some even in apoplexy). Occasionally the lateral ventricles have been opened and cleaned out. Haemorrhage into or about the fourth ventricle is most frequent. In tapping the ventricles an opening is made one and one-fourth inches above the external meatus and a groove director or trochar is pushed into the bram toward a point three inches above the other meatus. Relief of tension is alone useful, giving decided relief at times.

INFLAMMATION OF THE BRAIN AND ITS MEMBRANES.

How are inflammations of the membranes of the brain classified?

A meningitis may be a pachymeningitis (interna or externa), an inflammation of the dura mater; or, a leptomeningitis, inflammations of the pia mater and arachnoid; a sinus phlebitis, or an inflammation of the sinuses formed by the dura, often resulting in a sinus thrombosis

What are inflammataions of the brain itself called?

Cerebritis and cerebellitis.

What is the encephalon and what an encephalitis?

The encephalon consists of the cerebrum, the cerebellum, the pons, and the medulla. An encephalitis is an inflammation of all of these structures, or in connection with inflammations of the membranes. The cord and its membranes are often involved in an encephalitis.

Mention the different forms of inflammation of the brain and its membranes according to their character.

Diffuse or circumscribed, proliferating or destructive, acute or chronic.

Describe the diffuse and the circumscribed forms.

In the diffuse form, the disease spreads rapidly over the structures first involved, and from them over the adjacent areas.

In the circumscribed form, the inflammation is limited, although more than one structure may be involved.

Describe the proliferating and the destructive forms.

In the proliferating form, there will be a thickening and an adherence of the membranes to each other and sclerotic changes in the encephalon.

In the destructive form there is a breaking down of the inflammatory products into pus, resulting in either a spreading suppurative inflammation or a phlegmonous one in the meshes of the pia.

Describe the acute and the chronic forms.

The names may be considered sufficiently explanatory; however, in the acute form there is more apt to be a spreading, diffused and destructive inflammation, while the chronic form is frequently limited and is, therefore, circumscribed and proliferating.

Mention some causes of inflammation of the brain.

Tuberculosis, syphilis, alcoholism, cysts, tumors, caries, necrosis, diseases of the blood vessels, etc., and most frequently traumatisms (contusions, lacerations, intracranial hemorrhages, injuries to nerves, fractures, etc.), and, most important of all, septic infections.

How may septic infections occur?

In a number of ways. Compound fracture with wound infection; penetrating fracture; foreign bodies; from outside along nerves through their foramina of exit (nose, orbit and ear); vascular channels; by continuity along the perivascular sheaths; emboli.

When, after the injury, do the symptoms of acute encephalitis generally appear?

The second day after the injury.

Give some of the symptoms of acute and chronic encephalitis.

Acute—(a) Systemic, those referable to the head. (b) Localizing, occasionally. Rapidly rising temperature (to great height often); quick, full, bounding pulse; hurried respiration; constipation; anorexia; coated tongue, tenderness and local temperature rise; vomiting; hyperaesthesia; restlessness; sleeplessness; delirium; stupor, coma, death.

Chronic—Irritability markedly characteristic; local pain and temperature; cerebral vomiting; vertigo; loss of memory; headache; disturbances of motion, sensation and the special senses; anger, etc.

What is the treatment for acute encephalitis?
Same treatment as for head injuries. Remedies: Aconite, veratrum viride, bell., gels., stramonium, hyos., arnica, cuprum, etc.
Relief of tension by drainage, trephining and evacuating.

Give the causes of brain abscesses.
1. Traumatisms: Old fractures, lacerations and contusions of the brain.
2. Suppurative abscess in the nose, ear or orbit.
3. Occasionally from metastases of the lungs, heart, intestines, and during general tuberculosis.
Brain abscess is usually single.

Mention the varieties of traumatic abscesses.
Acute and chronic. The acute appears about two weeks after an injury.

Where are acute abscesses of the brain most frequently met according to their location?
They are mostly cortical, between the dura and the brain, and most frequently found in the frontal and parietal lobes. Occasionally, only, are they met with in the basal ganglia, medulla and pons.

Give a description of an acute abscess of the brain.
It consists of a collection of greenish pus with a very offensive odor and seldom of more than a couple of ounces in quantity. With this pus we find sloughs and clots. The abscess has no limiting wall, but is surrounded with an area of acute red softening. The course of such an abscess is rapid death if the pus is not evacuated.

Describe the course of a chronic abscess of the brain.
It usually gives a history of a slight injury (long ago) or brain inflammation or prolonged suppuration that has apparently gotten well. The abscess is generally found in the white matter of the brain. The centre consists of pus surrounded by a zone of mild proliferating inflammation, called the pyophylactic (pus guarding) membrane. These abscesses may not be noticed for years, and are only recognized on the post mortem table after they have suddenly been ruptured and their contents, possibly, emptied into the ventricles.

What are the varieties of brain abscess resulting from ear diseases? Describe them.
Acute and chronic abscesses.
They are always found in the tempora-sphenoidal lobe and in the anterior portion of the lateral lobes of the cerebellum. They are more common on the right side.

What is a great danger in mastoid abscess?
The abscess may break through into the lateral sinus and a thrombosis be formed.

How can ear diseases produce brain abscesses?
An obstruction of the tympanum may result in meningitis, sinus thrombosis or an extra-dural abscess. If the mastoid cells be affected, there will first be an extra-dural abscess, which may become a sinus thrombosis later on. In children the disease may spread along the petro-squamosal and masto-squamosal sutures inside the skull, or the spreading may occur along the auditory and facial nerves.

Give the symptoms of an acute brain abscess.

In the abscesses of an otitic origin, there will be no local symptoms. In the traumatic variety, when the abscess is in the parietal region, more definite symptoms are present. In the acute, delirium, nausea, headache, cerebral vomiting (vomiting that cannot be credited to disturbances of the digestive tract), worse on sitting up, diminished chlorides and increased phosphates. The symptoms are ushered in by a chill and a primary rise in temperature; then, because of the pressure, we have slow pulse, slow respiration, convulsions changing into paralysis, delirium changing to a stupor, coma and death.

Mention the symptoms of chronic brain abscess.

Chill, sometimes convulsions; subnormal temperature; local temperature rise; slow pulse and respiration; headache often misleading (especially otitic); mind irritable or dull, inattentive, slow to answer, pupils dilated and sluggish on the side of the abscess; convulsions or palsies; prostration and sick look, coated tongue, offensive breath.

Give a differential diagnosis between brain abscess and other brain diseases.

Mastoid Disease.—Otitis; local swelling, redness, oedema and tenderness (especially posteriorly) down neck; head symptoms occasionally.

Meningitis.—Sudden onset and progress; pulse rapid, weak and intermittent; high temperature; cerebral irritation.

Extra-dural Abscess.—High temperature; local pain and tenderness, oedema of scalp.

Thrombosis.—Repeated chills, fluctuating temperature; rapid, weak pulse; tenderness over sinus; hard jugular in neck; distended facial veins; tenderness in apices of cervical triangles; rigid sterno-mastoid. Finally a typhoid state.

What is the treatment for abscess of the brain?

Always trephine when a diagnosis of abscess is made. In traumatic cases, the operator may be guided by the injury; in other cases, exploratory openings should be made. If the dura does not pulsate, introduce a groove director into the brain, and if an abscess be found, enlarge the wound with a knife, using the groove director as a guide.

Give the treatment for brain abscesses following ear diseases.

Treat the ear disease first, as a rule, incising the upper and lower portions of the membrana tympani. The mastoid cells are then laid free by an incision a quarter of an inch behind the osseous meatus and a trephine opening of 1-4 of an inch is made. Tell the anaesthetist to watch for facial twitchings so that facial nerve may not be injured. When the symptoms do not disappear after this operation we must look for brain abscess.

How can otitic brain abscess be located?

Most of them are located in the dangerous region, which is found 1 and ¼ inches behind (on Reid's base line) and 1 and ¼ inches above the external auditory meatus.

Where should cerebellar abscess be trephined?

At a point midway between the tip of the mastoid and the inion on a line drawn between these two points. This will be just back of the masto-occipital suture.

What must sometimes be done in sinus thrombosis?

The jugular vein should be ligated far down, so that the clot can be washed out.

Mention the different varieties of brain tumors.

Tubercular. They are most frequently met with in young children and are apt to be multiple and basal.

Syphilitic gummata. They are most frequently found in adults. The iodide of potassium is of great diagnostic value.

Glioma and Sarcoma. They are most frequently found between the ages of 20 and 40. Gliomata are more apt to infiltrate the brain and are very vascular. Sarcomata are encapsuled and are less vascular.

Cysts (haemorrhagic). Usually of traumatic origin (parasitic). Echinococcus cysticercus hydatid.

Carcinomata. They are rare and are usually secondary to carcinoma elsewhere.

Give some symptoms of brain tumors.

They vary very much according to the location of the tumor. The most characteristic symptom is that the symptoms increase gradually. Other important symptoms are headache, vertigo, cerebral vomiting, gradual loss of intellect, optic neuritis, with atrophy of the optic nerve and loss of vision, loss of memory, stupor, epileptic fits, convulsive movements, motor paralysis. aphasia, hemianopsia.

What is the treatment for brain tumors? ,

Excision; but, if this is impossible, remove enough bone to relieve the pressure.

How many varieties of epilepsy are there?

Three: Symptomatic, traumatic and idiopathic.

Give the characteristics of symptomatic or Jacksonian epilepsy.

The convulsions are confined to one set of muscles. As a rule, it is not associated with a loss of consciousness. The muscles are generally paralyzed after the attack, because of the exhaustion of the motor areas. The sensory centre can be affected just as the motor is.

Give the surgical treatment for epilepsy.

Expose the centres that seem to be diseased. If a lesion be found make a complete incision. The paralysis following the excision of centers is only temporary, silent centres taking up the work of the ones lost. Scars must be as small as possible so as not to become irritating points. If an exploratory operation is to be made, use a double-pointed electrode (dipped first into an antiseptic solution) to paralyze the centre with a mild current. Insist upon a careful diet and a careful after treatment. Do not promise a complete cure.

Give the symptoms and treatment of focal epilepsy.

There is no evidence of trauma; unconsciousness and general spasm, which, however, begins in a certain set of muscles.

Treatment: Thorough excision, guided by the battery to the white substance. This is especially successful in parts, the equilibrium of which is not easily disturbed, e. g., shoulder better than hand.

Describe traumatic epilepsy.

It usually appears years or months after the injury. Slight attacks at first may increase in frequency and intensity. It may be caused by apparently slight injuries. Remember the importance of the external scar when it produces fits by pressure; also, remember the importance of peripheral irritation. There should be three years immunity before a cure can be claimed.

Treatment: The localizing symptoms are our guide when present. Otherwise, excise the scar tissue. If there are any bone lesions, trephine. Remove lesions of the dura, then of the brain. Be thorough, especially in a secondary operation.

What is often found to be the cause of petit mal?
An old injury or scar, or old lacerations of the brain.

What is the surgical treatment for petit mal?
First, remove all the peripheral irritation (adherent prepuce). If an old scar or an old skull fracture be present, trephine. If the lesion be thought to be in the brain, open the dura.

What is hydrocephalus?
It is a dropsical condition of the brain. The fluid may be in the ventricles or extra-ventricular. It is almost always of tubercular origin and may be either acute or chronic.

What is the treatment for hydrocephalus?
(a) Tapping of the anterior fontanelles followed by pressure with a bandage may be used.
(b) The ventricles may be tapped from the sides.
(c) The spinal cord may be tapped.
(d) The occipital bone below the superior curved line (being very thin) may be tapped and the fluid drained off. The draining must be done very slowly.

Are operations for headache and insanity permissible?
Yes, if these conditions are known to be of traumatic origin, or if the headache be clearly localized and a certain lesion suspected there.

SURGICAL DISEASES AND INJURIES OF THE SPINE.

What is the spinal column?
It is a bony column composed of thirty-three vertebrae. It is the axis of the body, supporting the head, connecting the head and the pelvis, and acting as an anchor for the ribs.

Of what use are the curvatures of the spine?
They are useful to give elasticity to movements, and to diffuse force and save the contents of the skull from shocks.

How does the dura of the spinal cord differ from that of the brain?
It does not serve as an internal periosteum. There is a large space between the spinal canal and the dura filled out with connective tissue, and the subdural space is smaller than in the brain.

Does a sub-arachnoid space exist between the arachnoid and the pia mater?
A space exists and is filled with a large quantity of cerebro-spinal fluid.

Where does the spinal cord begin and end?
It begins at the first cervical vertebra and ends at the first lumbar, its continuation below being called the cauda equina.

Where do the nerves leave the spinal cord and canal?
The first cervical escapes through the first vertebra while each of the others pass below the corresponding vertebra through the intervertebral foramina.

What is spina bifida?
It is a congenital defect and results from an arrested development and a failure of coalescence of the laminae.

What is the result of spina bifida?

There is a protrusion of the contents of the spinal canal. When such a hernia is composed of membranes and cerebro-spinal fluid, there is a meningocele. If there be a protrusion of membranes, cord substance and nerves, it is a meningo-myelocele. When the hernia consists of membranes, cord and, within the latter, some fluid causing a sac, it is called syringo-myelocele or myelia.

Where are such growths usually located?

Lumbar, 50 per cent.; lumbro-sacral, 12 per cent., and sacral, 27 per cent.

What are the sizes of these herniae?

They vary from the size of a walnut to that of a cocoanut.

What is spina bifida occulta?

A condition in which the defect of the vertebrae exists with but a slight protrusion of the contents. The only visible sign, in this condition, is an area of hair in the location of the defect, it being often mistaken for a mole.

What are the symptoms for diagnosis in spina bifida?

Because of the communication between the spinal cord and the brain, there is an impulse or swelling from crying, coughing, etc. Upon the reduction of the tumor, symptoms of intra-cranial pressure are developed. There may be a paralysis of certain organs, the bladder, the sphincter of the rectum, or the legs. As a rule the herniae will transmit light, and upon looking through them black lines can be seen which represent the nerves. There are usually some other errors of development, such as hare-lip, etc.

What is the prognosis of spina bifida

It is bad, as most of the children afflicted with it die. Usually rupture, convulsions, septic meningitis; occasionally there is a spontaneous cure, especially if a meningocele. There may be bony formation even after rupture.

Give the treatment for spina bifida.

It may be protective, to prevent rupture or injuries; and this is usually accomplished by covering with a metallic cup of silver or aluminium held in position with straps.

If very small, cotton may be placed on it and painted over with collodion.

The treatment may be operative.

Describe the operative treatment for spina bifida.

It is of two kinds:

a. The injection method. This was very popular before the days of antisepsis. It consists in drawing off a quantity of the fluid with a trochar, after which a few drops of Morton's fluid are injected; this is kept up for a week. Morton's fluid consists of 10 grains of iodine, 30 grains of the iodide of potassium and 1 ounce of glycerine.

b. Excision. This method has become very popular within the last few years. It consists in cutting into the sac, i. e., opening into the sub-arachnoid space; and, after excising the sac, sewing up the neck. German operators have tried to prevent the recurrence by drawing the periosteum or even sliding sections of bone over the wound and then closing it.

Give a general description of sacral cysts.

They are cysts occuring in the median line or slightly to one side or the other of the spinal column. They will be found to fluctuate and

are similar in appearance to spina bifida occulta, and often resemble lipomata. Operation is dangerous, as they are not recognized, and asepsis is hard.

Give a description of a coccygeal dimple and sinus.

It is a vestige of an opening into the spinal canal. It varies in depth and often contains a fold of hair, when it is called a pilo-nidal sinus. The skin leads down to the periosteum or the bone.

Describe dermoids found over the sacrum.

They are congenital sacral tumors made up of tissues or parts of a foetus, and occasionally communicating with bladder or rectum. They might be called a post-anal gut between the spinal and alimentary canals. They are usually made up of several cysts lined with columnar epithelium and containing a viscid material. They generally form a large mass near the coccyx, and they are apt to break down and suppurate from injury. They should be treated by an extremely careful excision.

FRACTURES OF THE SPINE.

What per cent. of fractures occur in the spinal column?

Three to four per cent. Usually in males, especially in middle life.

Give the causes of fracture of the spine.

Occupation, usually occurring in the male. They are apt to be produced by some crushing force, by falling on the feet from a great height, from caving in of embankments, and through twistings and bendings of the spine; forced flexion and extension.

What portions of the vertebral column are most frequently fractured?

The dorso-lumbar and the cervico-dorsal junctions.

Why are fractures of the spine so dangerous?

Because of the coincident or resulting injuries to the spinal cord (pinching of the cord).

Give the most important symptoms of fractures of the spine.

Intense pain, aggravated by motion; deep-seated tenderness with ecchymosis; paraplegia; loss of sensation, or motor paralysis on one side and sensory paralysis on the other; deformity and abnormal mobility; disturbances of the sexual organs may show themselves in constant erections; alkaline urine due to the excess of phosphates; paralysis of the rectum and bladder with retention of faeces and urine. The dribbling of urine, occuring later on, is only an overflow and another symptom of retention of urine. There is also muscular wasting, loss of vitality of the skin, and as a result of it, bed sores with a tendency for the soreness to spread over larger areas.

What are the symptoms of fractures of the lower regions of the spine?

In such cases the fracture is below the cord proper and the cauda equina may not even be pinched. The symptoms are not so marked and paralysis is not so liable to be present. There is some pain, tenderness and weakness on walking.

What are the symptoms of fractures of the lower dorsal and upper lumbar regions?

Sensory and motor paralysis of the lower limbs, bladder and rectum. These patients usually die in from six months to two years from exhaustion, bed sores, cystitis.

What are the symptoms of fractures in the dorsal and cervical regions?

The same symptoms as in the dorsal and lumbar, and, in addition, paralysis of the abdominal muscles with tympanites and paraylsis of the intercostal nerves producing dyspnoea. Other symptoms may be found in fractures above the fourth cervical vertebra; the phrenic nerve may be pinched and death follow (often hyperaesthesia above from congestion above injury). Fractures of the axis or atlas (especially if of the odontoid process with dislocation) are almost invariably fatal.

How can a fracture or a dislocation of the spine be reduced?

By extension, counter extension, and careful manipulation, always keeping in mind the danger of pressure. The parts are kept in place by fixing the head or the body with sand bags. Suspension may be made from under the arms or extension at the feet.

Give the important points for after treatment.

The patient should be placed in a water bed, and kept clean, as urine and faeces pass off involuntarily. Bed sores should be treated by a preventive method: Rub the skin frequently with a saturated solution of alum in alcohol. If the skin show signs of breaking, use zinc powder. When sloughs form, use antiseptic dressings, and when granulations begin, use stimulating dressings. Careful attention should be paid to the bladder, as retention of urine generally occurs. Remember that phosphaturia is a common feature in such cases, therefore use catheter only when absolutely clean surgically. Draw the urine about three times daily, and wash the bladder once or twice daily with a ten per cent. solution of boracic acid, or Thiersche's solution.

When is laminectomy indicated, what are its uses and how is the operation performed.

It is indicated whenever there are signs of pressure on the cord. Its uses are numerous: To permit of examination of the dura and cord; to remove a clot; to reduce fracture and dislocation and to remove fragments; to remove tumors of the dura or foreign bodies; and to treat the bodies of the vertebrae in Pott's disease.

Laminectomy is the removal of a part of the posterior portion of the spinal canal to relieve pressure. This is done by the median incision, separating the muscles and exposing the laminae. Divide the spines at the base of the arches near the transverse processes. The rongeur forceps is a very useful instrument here. Palpate the cord. When the dura bulges and is dark-looking, a blood clot exists; when yellow, pus is indicated. In either case open the dura, wash out the clot and suture. Allow the rest of the wound to heal by granulation.

DISLOCATIONS OF THE SPINE.

Where do dislocations of the vertebrae occur?

Usually the 4-6 cervical, rarely dorsal and very rarely lumbar (3-4). They are apt to be associated with fractures. The dislocation may be unilateral or bilateral (one or both sides may slip off) produced by violent twists. Bending forward and backward would produce bilateral dislocations, and these are most usually found in the cervical region, and can easily be made out by placing a finger in the pharynx and by palpation posteriorly with the finger of the other hand; and also from the position of the head, which is fixed.

Mention and describe the principal dislocations in order of frequency.

Alto-axoid: Next in frequency, usually occuring with fracture of the odontoid and laceration of its ligament and the articular ligaments from an unusual rotation. This variety is usually fatal and hard to diagnose. The treatment is reduction, which may result fatally, and retention.

Occipito-atloid: This is rare and is due to great violence. There is a separation of the occipital condyles from the articular depressions on the atlas.

Dorsal: This is always accompanied by fracture.

The after treatment for all is the same as for fracture.

In which sex do fractures and dislocations of the coccyx most frequently occur, and what are the symptoms?

In women from falls, kicks or labor. The dislocation may be forward, backward or lateral. The symptoms are localized pain, swelling, tenderness, deformity, pain by any motion, as from stool or sitting down. The actual deformity is best made out by the introduction of a finger into the rectum and palpation on the outside with the other fingers.

Give the treatment for coccygeal dislocations.

Manipulate externally and through the rectum. Deformity is apt to recur. In inveterate cases, excise.

Give the symptoms and treatment of coccygodynia.

It is a neuralgia of the coccyx and is very annoying. There is but one remedy, viz., removal of the bone. It can be reached by a median incision. The assistant should introduce his finger into the rectum.

POTT'S DISEASE AND SPINAL ABSCESSES.

What is Pott's disease, and at what age is it most frequently found?

It is essentially a tuberculosis of the bodies of the vertebrae. Occasionally it is found in the laminae. It usually occurs in the young between the ages of two and ten years, and ninety per cent. occur before puberty. In rare cases only, the disease is met with in adult life, and then it is usually accompanied by a history of traumatism. It occurs mostly in families afflicted with tuberculosis and among the poorer classes. It is called Pott's disease because it was first discovered or described by the surgeon Pott.

By what other names is Pott's disease frequently called?

Tuberculosis of the spine, spondylitis, and spondylitis tuberculosa.

Give the pathology of Pott's disease.

There may be a slight traumatism in a child who cannot resist the tubercles (predisposed), an inflammation in the bodies of one or more vertebrae occur and a rarefying osteitis result. The next step is fatty metamorphosis and then we have caseation. This makes the bone soft and the weight of the body bends the spine so that the bodies of the diseased vertebrae nearly disappear, anteriorly especially. Instead of caseation there may occur a condensing osteitis and the formation of scar bone, but if the process continues, we may have a coid abcess.

Give the most important symptoms of Pott's disease.

Most important of all is the rigidity of the spine; in picking up some thing, the child tries to take the weight off the spine. When the disease is in the upper vertebrae, the position of the head is like that of torticollis. The shoulders are held up, the patient taking careful steps. There is a tenderness in the spine (tell the child to jump down from a table). The symptoms are all aggravated by pressure on the head or on

the tuberosities of the ischia. The symptoms are ameliorated by lifting the patient by the head. Patients are afraid of twisting or jarring the spine.

What symptoms are expected to be found in Pott's disease in the lower portion of the vertebral column?

Irritability of the bladder and the sexual organs. Pain in the lower portions of the belly. When the lesion is higher up, there is tympanites. The patient will refer to a painful spot in the epigastrium. There will be a peculiar grunting breathing due to the pressure on the intercostal nerves.

What symptoms are to be found in Pott's disease in the cervical region?

Numbness and tickling in the fingers, difficulty in deglutition and an irritating cough.

Why is deformity of so little diagnostic value in Pott's disease?

Because if once present we are unable to prevent a larger deformity.

How may Pott's disease be diagnosed?

Observe the patient's walk and the manner in which he picks things from the floor. Tell him to jump from the table. Test the rigidity of the spine by placing the child on the face, holding the neck and raising the legs. They cannot be raised to any distance. Ascertain if there be any contraction of the psoas muscle. Remove the weight from the spine and the symptoms will be relieved.

What is the prognosis of Pott's disease?

If able to keep up the strength of the patient and the spine straight there is a fairly good outlook for recovery without much deformity.

Give the treatment for Pott's disease.

First, treat patient as any tubercular subject, using hygienic measures and the indicated remedy. Second, give the inflamed bones rest by transfering the weight to some other point. Third, do not be misled by marked ameliorations; they are often followed by relapses. Fourth, insist upon a recumbent position in bed; but this has the disadvantage that the patient does not receive fresh air.

Describe some dressings for Pott's disease with which the patient can be carried into the open air.

Take four pieces of gas pipe, twice the length and twice the width of the patient, and apply bandages over the pipe pieces and the child. This will keep the patient in the correct position and he can be carried out doors. Leave the space around the arms free. Another plan is to lay the patient on a piece of paper and make a drawing of his form; then saw a piece of wood exactly after this model, pad it, and bandage the patient upon it.

Describe the method of applying a plaster of Paris jacket.

The body should be covered with a soft, closely-fitting, woven shirt without arms, but with shoulder straps to hold it in position; or, better still, use undershirt tubing, which can be bought in two different sizes. The latter is particularly recommended for adult females. Next, pad the hump and the crests of the ilia. In females, a pad should be placed over each mammary gland. A few towels should also be placed over the abdomen. The patient should next be suspended by an apparatus consisting of a collar and arm pieces fastened to a cross bar, which is attached above by a cord and a pulley to a tripod. The patient should then be slowly raised by the apparatus until only the toes are in contact with the floor, and the extension should not be carried to the point which makes it uncomfortable to the patient.

The plaster bandage must be freshly prepared or one from a hermetically sealed box used. After it has been soaked and squeezed, a turn should be made with it around the body above the pelvis, and it should then be carried downward below the iliac spines, and from this point should be made to ascend gradually, by spiral turns, until it reaches the axillary line. The turns should be applied smoothly and not too tightly. After one or two layers of these turns have been applied, the surgeon, if he desires to use few bandages, may rub some moist plaster of Paris on their surfaces. The turns are repeated until a bandage of the desired thickness has been applied, and the surface of the dressing may be finished by rubbing moistened plaster over it. Four bandages are generally required for a jacket of this kind for a child and six or eight for one for an adult.

The patient should be kept suspended until the plaster has set (usually from ten to fifteen minutes) and then should be lifted carefully so as not to bend the spine. He should then be placed on his back on a mattress until the dressing becomes perfectly hardened. The dinner and mammary pads, if used, should next be removed. In applying this dressing, strips of tin or zinc may be placed between the layers, if greater strength is desired in the dressing. The foundation for such dressings is the pelvis.

Is this dressing satisfactory in all cases of Pott's disease?

No. All cases in which the disease is above the seventh dorsal vertebra need suspension of the head. The best appliance in such cases is the jury-mast.

Describe the application of the jury-mast.

The same steps are taken in the preparation of the patient as in the application of the plaster of Paris jacket with the exception of extension, which need not be used.

After three or four layers of plaster bandage have been applied to the body, the apparatus is applied. This is made of two bars of metal having two strips of zinc attached. These strips partially encircle the body and are held in position by turns of the plaster bandage. The perpendicular bars have at their upper part a slot, into which the lower end of the jury-mast fits and is secured by a screw. To the upper end of this is attached a cross bar, which is movable and to which are fastened the straps of the collar by which the head is suspended.

How long may the plaster jacket be left on?

Two, three or six months. The tubing can be replaced by a new one without removing the jacket. The jacket should never be in the form of a corset unless the treatment of an ulcer or an abscess make it necessary.

How is the removal of a plaster jacket accomplished?

With a saw made especially for this purpose, or with a heavy plaster of Paris shears, or, after the application of sulphuric acid, it can be removed with a pen knife.

Give the treatment for paralysis following Pott's disease.

The treatment is carefully applied suspension. Watch the patient's face, as flushes of the face are indications to stop. See that the straps on the head do not slip during suspension.

Describe spinal abscess in the cervical region.

Cervical abscesses are most commonly located behind the pharynx and when they become large enough, or open of themselves, may cause death through suffocation. They may appear in the neck and be mistaken for glandular abscesses. They may also burrow along the sterno-cleido-mastoid muscle.

Describe abscess of the dorsal region.

The abscesses may pass between the transverse processes of the vertebrae and appear on the back forming a dorsal abscess. They may pass downward through the diaphragm and form a psoas abscess (where running along the psoas muscle), or a lumbar abscess (where following the course of the quadratus lumborum). They may also form a thyroid or an obturator hernia.

Describe the treatment for spinal abscesses.

The great danger lies in double infection, therefore do not open the abscess unless there is good reason for so doing. Draw the pus out with an aspirator after the skin has been sterilized. An injection of glycerine and iodoform or balsam of Peru is not now used as formerly. If through and through drainage be possible, aspiration is not needed.

How should contraction of the psoas muscle be treated?

Treatment is of two kinds: (a) It may be forcibly over-extended with the patient under ether, or (b) gradual extension may be used until the contraction is corrected. Some surgeons make a partial division of the muscle.

SPINAL CURVATURES.

What is kyphosis?

It is a backward curvature of the spine.

What is lordosis?

It is a forward curvature of the spine, frequently compensating (to counteract something else).

What is scoliosis?

It is a lateral curvature of the spine.

What is the most frequent result of Pott's disease?

Kyphosis or angular curvature in the dorsal region, but, because of the normal anterior curves, this may not show itself until into the cervical and lumbar regions. When the hump once appears, the parts can never be straightened. There may be some pressure on the spinal cord and some paralysis, or, more commonly, a slight inflammation of the dura (pachymeningitis).

Mention some conditions causing kyphosis which are not due to Pott's disease.

a. Old age.
b. It may be produced in rickets.
c. It may be due to bad positions.
d. Salt deposits in the cartilage in gouty subjects.
e. An arthritis.

In the aged you can do nothing. The rigidity, etc., is usually absent, patients are not afraid to jump.

What are the causes of lordosis?

It occurs most frequently in the lumbar region. It may be due to tubercular disease of the arches of the vertebrae, but more frequently it is compensatory. We find it in hip joint disease, viz., anchylosis or congenital dislocation of the hip.

What are some symptoms of scoliosis?

The vertebral column is not only curved laterally, but also rotated. The intervertebral discs become wedge-shaped. There will be a projection of one of the scapulae. At the rotation we have a hump. Prominence of one breast. One shoulder is higher. One ilio-costal space is smaller, shorter and deeper than the opposite.

Give causes of scolosis?

Predisposing causes are: A run-down system. Little resistance. Low vitality. Exciting causes are: Faulty positions in walking and sitting. Inequality of lower limbs. Errors in refraction. Diseases of the spinal cord that produce atrophy of the muscles of one side.

What age and sex suffers mostly from scoliosis?

It is mostly found between the ages of ten and twenty, more correctly from twelve to eighteen years. Girls who are weakened from growing rapidly, who are near puberty, or who went through a long time of suffering, are more frequently afflicted with it than boys.

What are the first symptoms of scoliosis?

There may be a considerable deformity before it is recognized. Mothers usually find that one shoulder is higher; one scapula more prominent. In boys the suspender of one side slips off frequently. By examination we find that there is a rotation of the spine, and by dropping a line from the vertebra prominens to the floor, we will find the lateral curvature. Place different sized books under one limb, to see if the spine becomes straighter.

How many varieties of scoliosis are there?

Three. 1. Incipient, in which we have only a slight deformity. 2. In which there is considerable deformity, but a still flexible spine. 3. A rigid spine, the deformity is considerable and the spine cannot be flexed.

Describe the treatment for the first variety?

This variety never requires an apparatus. The predisposing cause should be removed; give, therefore, a tonic treatment. Correct clothing and diet. See that an occupation is selected that does not aggravate the condition. Prescribe a remedy after the totality of the symptoms. The local treatment consists in bolstering the leg up, if one is shorter than the other. If it is a habit of walking or sitting, teach the patient to keep upright. The hand of the hollow side should always be kept in front, the other one behind during walking. Strengthen the muscles on the opposite side. Use Swedish movements.

Describe the treatment for the second degree.

Beside the treatment given in the first degree, we apply a jacket while patient is suspended. This is done after or according to the jacket described in Pott's disease, but it differs in being made like a corset in scoliosis so that it can be taken off. If desired, any instrument maker will make a neat and reliable corset after such a plaster of Paris model. The corset should always be put on while the patient is in suspension; the same rules apply in taking it off. It should be worn throughout the day, except when the patient takes his suspension and Swedish movements.

What is the treatment for the third degree of scoliosis?

In addition to the general treatment given for the first degree, the patient must lie in a sling upon the affected side. Or you may press forcibly against the hump, advising patient to lie upon it for one half hour afterwards. The sling of Bradford may be used.

DISEASES AND INJURIES OF CORD.

What are the chief differential symptoms between fractures and dislocations of the vertebra, and hemorrhage within the spinal canal?

In fractures and dislocations we have almost immediately paralytic symptoms, due to compression. Paralysis from hemorrhage comes on

some hours after the injury, and is apt to spread, involving one portion after another.

Where does spinal hemorrhage most frequently occur and what are the symptoms?

Especially in the cervical region. There is an interval between the time of injury and the onset of symptoms, usually some hours. This interval is followed by paralysis and anaesthesia below the lesion with retention of faeces and urine.

What are the varieties of spinal hemorrhage?

Extra-medullary, hematorrhachis (extra, or sub-dural); intra-medullary, haematomyelia.

Mention the results of spinal hemorrhage.

Hemorrhage sufficient to destroy the cord, produces paralysis and atrophy. Hemorrhage causing compression alone, usually subsides, as the blood is absorbed, leaving spastic symptoms in the lower limbs if degenerative changes have taken place.

Give the symptoms of extra-medullary hemorrhage.

There are, first, irritative symptoms; then, sudden and violent pain in the back, more or less diffused; pain along the nerves emerging near the hemorrhage with hyperaesthesia and tingling and spasms of muscles supplied by these nerves and those below the hemorrhage occasionally; convulsions; spasmodic retention of urine; then paralysis.

Mention the symptoms of intra-medullary hemorrhage.

The paralytic symptoms come on at once or early; irritative symptoms are absent or of short duration; bed sores (severe). The disease runs a rapid course and is usually fatal.

Give the treatment for spinal hemorrhage.

Early or late extra-dural hemorrhage justifies an operation, if warranted by the condition of the patient. The lower the hemorrhage the better the prognosis.

Give the symptoms of compression of the cord and mention their indications.

1. Symptoms coming on at once after the injury usually indicate fracture or dislocation or a combination of the two.

2. Symptoms coming on shortly after the injury, i. e., some hours, indicate a probable hemorrhage—the intra-medullary producing more rapid paralysis, while the extra-medullary have the irritative symptoms first.

3. Symptoms ensuing after 1-4-8 weeks probably result from lymph which indicates most frequently an external pachymeningitis of Pott's disease—may spread to cord substance.

Mention the causes and results of contusions of the spinal cord.

They are due to severe sprains, usually forced flexion. They result in hemorrhage into the cord—haematomyelia—usually into the gray substance. The hemorrhage may extend quite a distance, producing motor and sensory paralysis anad lessened reflexes. Symptoms of a hemorrhage may be followed by an acute myelitis and degeneration and destruction of the cord.

What diagnosis and prognosis can be made?

When they result from fracture, diagnosis is almost impossible when there is no deformity. Prognosis is favorable as the patient usually gets better, improvement coming on usually in 2-3 weeks.

What symptoms will follow a contusion of the spinal cord?

They are similar to those described under contusions of the brain, characteristic shock, followed by symptoms that point to the affected portion of the cord. These symptoms vary according to the extent and location of the hemorrhage. The symptoms are temporary. Cases of slight injury recovering in three to four weeks are usually looked upon as contusions of the spine.

What is a railway spine?

This is a rather extensive term, meaning a severe sprain of the spine. The latter is frequently associated with laceration of the ligaments, muscles and plexuses of veins. A hysterical condition, due to profound mental impression, frequently follows.

What is the treatment for such a condition?

Rest is of the greatest importance. The personality of the physician is also an important point. Regular diet, massage, Faradism. Select the indicated remedy.

To what is traumatic hysteria due?

It is found mostly in neurotic subjects and may be due to an extensive operation, or produced by being in a horrible accident.

What symptoms may develop in real traumatic hysteria?

Hysterical insanity, epilepsy, contractures of limbs, all kinds of sensory and vascular disturbances.

How are these cases best treated?

By a rest cure. The patient is isolated, stuffed with food, and has daily massage. (Weir Mitchell treatment.)

What other pathological conditions in and around the spinal cord may produce pressure symptoms?

a. Inflammatory products. b. Tumors.

Describe symptoms due to inflammation.

We may have an inflammation of the dura, the inflammatory products giving rise to irritating symptoms: Exaggerated reflexes, convulsive movements, spasmodic retention of urine. The paralysis is less complete.

Where are tumors of the spine found?

They may be intra- or extra-medullary.

What kinds of tumors are found in the spinal cord?

Lipomata (fatty tumors) are most common. Fibromata and mixomata are also often found. Of the malignant variety we have sarcomata. Carcinomata here, as well as in the brain, are metastatic growths, secondary to carcinomata elsewhere. Tubercular and syphilitic tumors are also frequently found.

What are the characteristic symptoms of tumors of the spinal variety?

The symptoms develop very gradually. There is a localized pain on one particular spot, usually described as rheumatic, neurotic or burning in character and associated with tenderness. The pain is worse on exertion. From one focus we have irritating or paralytic symptoms. The paralysis as a rule spreads from below upward and is followed by atrophy of muscles. The pains are unlike those of hemorrhage and inflammation, because the tumor is frequently on one side; therefore, the pain and reflexes appear on one particular side.

What is the treatment for tumors of the spine?

Either remove enough bone to allow the tumor to grow, or when possible remove the growth.

What treatment is used for obstinate neuralgia, not due to pressure of hemorrhage, inflamation or tumor?

The pain has been removed by laminectomy and division of the nerve roots.

SURGERY OF THE NERVES.

What symptoms arise from contusions of nerves?

When the contusion is severe we have numbness, with loss of muscular power. If only a slight contusion, there is tingling.

What does the term crutch paralysis mean?

A paralysis brought about by long-continued pressure. Example the pressure of crutches upon the axillary region.

Give important symptoms of paralysis of the facial nerve.

There would be bulging of one cheek on account of the relaxation of muscles. Smiling would be one-sided. When patient is asleep the saliva dripples out at one side of the mouth; shuts only one eye; therefore the cornea of the other eye will be exposed, becomes dry, and this may result in inflammation of the eye. Chewing and speaking are difficult.

What would an injury of the ulnar nerve cause?

Motor paralysis of the muscles supplied by it.

What are the most common causes of laceration of the musculo-spiral nerve?

Bone fractures, callus, or inflammatory tissue.

What is a characteristic symptom when the musculo-spiral nerve is injured?

Wrist drop.

Is the musculo-spiral nerve motor or sensory?

Both. It divides into the radial, which is sensory, and supplies the outer side and ball of the thumb and the dorsal integument of two and one-half fingers; and into the posterior interosseous, which supplies all of the muscles on the back of the forearm, except three, and also sends a filament to the wrist joint.

Is there a great loss of motion when the median nerve is injured?

The most prominent symptom is that the patient is unable to pronate, and cannot flex the thumb.

What is the result when the sciatic nerve is injured?

The muscles of the leg are paralyzed, and when the patient walks he has to use the muscles of the thigh.

What results from injury to the popliteal nerve?

This nerve is frequently injured in fractures of the femur, the result is foot drop.

What is the result of injury to the phrenic nerve?

Dyspnoea. Injuries to this nerve are invariably rapidly fatal.

When may neuralgia become a surgical disease?

When it has its origin in the peripheral nerve portions.

What is neurotomy?

It means the cutting of a nerve.

What is neurectomy?
The dissecting out of a nerve.

What is neurectasy?
Nerve stretching.

What nerves are sometimes resected to relieve torticollis?
First, second and third spinal nerves and spinal accessory.

Describe a nerve suture?
Pass a stitch through the fibrous sheath of both ends of the nerve and tie it on both sides. When one end of the divided nerve has a bulb trim it off before you unite it.

What are neuroplastic operations?
Operations to unite a nerve of which a piece of its length is lost.

Describe some neuroplastic operations.
Make a cut in the middle of one divided end, and unite this portion with the other nerve ending.
Some operators put a string of catgut between the divided nerve endings, so that the nerves unite by granulation. Nerves of lower animals have been transplanted, but as a rule the nerve fibres give the same result as catgut.

What operation may be done to get a broader surface of the nerve endings?
Split one end for a little distance and insert the other end after trimming it to a point. Or split both endings and unite.

Where is neurectomy preferable to neurotomy?
In muscular spasms. If we should divide the nerve, complete paralysis would result.

How far can a nerve be stretched?
About 1-20 of its length.

How much weight can the sciatic nerve stand?
About eighty pounds.

How much weight can the supra-orbital nerves stand?
About six pounds.

Where can the facial nerve be best reached?
In front of the ear, before it enters the parotid gland.

What methods are used to stretch the sciatic nerve?
Two: The bloodless and the bloody method.
The bloodless is done by overstretching or rather overflexing the perfectly straight leg towards the abdomen. The bloody method is done by an incision midway between the tuberosity of the ischium and the trochanter.

In what conditions is nerve resection nearly the only relief?
In tic douloureux or trifacial neuralgia.

Describe neurectomy of the infra-orbital nerve?
Explore the infra-orbital notch or foramen by an incision, lift the eyeball, break down the floor of the orbit, and divide the nerve as far back as possible. As many as possible of the peripheral nerve endings are removed.

How can you best attack the third division of the fifth nerve?
An incision along the ramus of the inferior maxilla is made (this sore will be hidden afterward), the soft structures are loosened, and a trephine button removed.

How can Meckel's ganglion be reached?

Either chisel into the antrum of Highmore, or break through the floor of the orbit.

What operations are used to attack the Gasserian ganglion?

Two: 1. Operation of Rose. 2. Operation of Hartly Krause.

Describe the operation of Rose.

Make an incision and remove the zygomatic arch, liberate the masseter and temporal muscles, and remove the coronoid process of the jaw. Apply a trephine around the foramen ovale and remove a button. With a small curette the Gasserian ganglion can be removed.

Describe the operation of Hartly Krause.

Make an incision at temporal region, loosen the bone and turn it down still attached to the muscles. Lift the temporo-sphenoidal lobe of the cerebrum, and the Gasserian ganglion can be reached.

What is the most common nerve tumor and what is the treatment?

The bulbous end. The only treatment is excision.

What would you do in case of dislocation of the ulnar nerve?

This is a very rare occurrence. Try to put it back in place, or stitch the nerve to the forearm.

SURGICAL DISEASES AND INJURIES OF THE ABDOMEN AND ITS VISCERA——ABDOMINAL SURGERY.

CONTUSIONS OF THE ABDOMEN AND ITS ORGANS.

How are contusions of the abdomen divided?

(a) Those involving the abdominal wall only. (b) Those involving the viscera.

What may be the result of contusions of the abdominal wall?

(a) Subcutaneous haemorrhage. (b) Haematomata. (c) Rupture of one or more of the muscles. (d) Hernia.

Give the symptoms and treatment for a ruptured muscle.

Pain at the seat of lesion; the muscle cannot do its work. If the muscle tries to work, gaping is the result. The treatment lies in aspiration, cutting down and suturing the ruptured part.

How would you treat a haematomata of the abdomen?

Let it alone; they are as a rule quickly absorbed. When you have signs of its breaking down, then empty the cavity of the blood clot.

How are contusions of the abdominal viscera divided?

(a) Contusions with rupture of a hollow organ with extravasation. (b) Contusions with rupture of a solid organ with haemorrhage.

What symptoms arise when we have rupture of a hollow organ with extravasation?

Pain, tenderness, vomiting, more or less distention, rigidity of the muscles, high pulse and more or less collapse, tympanites. If gas escapes there is absence of liver dullness.

What are the symptoms of rupture of a solid organ?

Faintness, pallor, feeble, rapid pulse, superficial respiration (rapid), cold sweat, thirst and shock. If bleeding is extensive we have dullness on percussion in the flanks. If the haemorrhage is behind the peritoneum, we have a rapidly growing tumor.

Why is not the stomach as frequently ruptured as other organs, and why is this less dangerous?

Because of the thickness of its walls. It is not as dangerous, because a small leak will be closed up by the turning out of its own mucous membrane. If, however, the rupture is in the posterior wall, infection of the lesser omental cavity may result and produce a subphrenic abscess.

What are the symptoms of a ruptured stomach?

Pain in the epigastrium with tenderness. Slowly developing symptoms of peritonitis, haematemesis.

What is the treatment for ruptured stomach?

Open the abdomen, find the rupture, and unite with a Czerney-Lembert suture, or pack.

What are the symptoms of a ruptured intestine?

Characteristic pain at or a little below the umbilicus, through the solar plexus to which the pain is referred. This is rapidly progressive. Tympanites, when a great deal of gas escapes. Usually a rapidly developing peritonitis following the faecal infection.

How would you treat a ruptured intestine?

Make an incision in the median line of the abdomen; or, if there be localized pain on one side of the abdomen, incise and hunt for the lesion; but avoid evisceration, as it produces severe shock. It may be necessary to resect or make an artificial anus, or to suture. If the haemorrhage is so severe and it cannot be located, have the assistant compress the abdominal aorta. Then protect and drain by gauze packing.

What are the results of a rupture of the gall bladder?

There may be transitory, localized pain and shock; or, if the lesion become inflamed and disturbed, rapid infection.

What is the treatment for rupture of the gall bladder?

Either suture or pack or use the abdominal toilet.

Give the symptoms of a ruptured spleen, pancreas or liver.

Haemorrhage and localized pain. Peritonitis rare. Localized abscess common.

What is the treatment?

If the symptoms are serious, operate; if mild, the expectant method is in order. Arrest haemorrhage.

What is the abdominal toilet?

It is the thorough cleansing of the abdomen by means of sterile tampons.

Name the solid organs of the abdomen which may be ruptured, in order of frequency.

Kidneys, spleen, liver, pancreas, omentum, mesentery.

How would you treat rupture of the kidneys or spleen?

Either by packing with iodoform gauze, or removal.

How would you treat a ruptured mesentery?

Control the hemorrhage and pack, provided the intestine has yet enough blood supply. If the latter looks pale and the blood supply is lost, resection is necessary.

How are wounds of the abdomen divided, and describe each?

(a) Penetrating, which perforate the abdominal wall, entering the cavity. (b) Non-penetrating, simply involving a part of the abdominal wall.

Describe the treatment of non-penetrating wounds.

Suture the wound accurately to get primary union, and avoid scar tissue, which may produce a hernia. Never drain if it can possibly be avoided.

How can it be ascertained whether the wound be penetrating or non-penetrating?

By careful dissection with a groove director. The probe or finger should not be used. When the penetration is found, enlarge and explore.

How are penetrating wounds produced?

By sharp instruments and missiles.

In what part of the abdomen are bullet wounds most dangerous?

From side to side; next when entering below the umbilicus and finally when entering above the umbilicus.

How would you diagnose which viscus was injured?

Enlarge the wound and explore.

Are all wounds injuring the viscera fatal?

Not necessarily. Multiple perforations of the intestines when close together can be resected; the stomach sewed up and the solid viscera packed. Mesentery should be treated as when ruptured and omentum ligated.

Where is the pain located in injuries to the abdominal viscera?

In injuries to the stomach the pain will present itself at the location of that organ. In injuries of other organs we may have either a general pain or a pain referred to the solar plexus, situated behind the stomach.

What influence has the communication of the splanchnic nerves with the intercostal in injuries to the abdomen?

It produces rigidity of the muscles and chest breathing.

What germicide is used for the abdominal cavity?

As a rule it is only allowable to use the normal salt solution; if, however, the peritoneum is inflamed and its appetite appeased, bichloride of mercury may be employed.

How can you prevent the growth of germs in the abdominal cavity?

By keeping it as dry as possible and draining it. Moisture forms a culture medium for the germs.

What bacteria are found in the abdominal cavity?

Bacilli coli communis are the commonest, and owe their virulence to the streptococcus, which is the most virulent of all. The staphylococcus are the less frequent and less virulent. Pneumococci and gonococci (usually mixed).

SURGERY OF THE PERITONEUM.

What is the extent of the surface of the peritoneum?

It probably equals that of the skin surface.

What is the benefit of the absorptive power of the peritoneum?

It is greatly beneficial in that it carries off a certain amount of septic material, being able to absorb ⅜ per cent. of the body weight; but when this is in considerable amount this power is disadvantageous, as the septic material may be carried through the whole body and a septicemia produced.

What part of the peritoneum is most susceptible to inflammation?
The visceral layer.

How much time is required for the peritoneum to heal?
It will heal fairly well in about six to twelve hours, the healing being complete in about a week.

What is peritonism?
It is shock on the system produced by the sensitiveness of the peritoneum. This shock may be so great as to kill the patient without a lesion.

Give the nerve supply to the peritoneum.
It is supplied by the sympathetic nervous system, especially the splanchnic nerves. The latter communicate with the filaments of the seven lower intercostal nerves on one side, and with the solar plexus on the other.

Give the pathology of peritonitis.
First we have congestion and vascularity, and this is followed by an exudate.

What are the varieties of peritonitis?
(a) Serous peritonitis, when only serum is thrown out.
(b) Fibrinous peritonitis, where the exudate contains fibrin.
(c) Purulent peritonitis, when it contains pus.
(d) Plastic or adhesive, often preventing the spread of infection.
(e) Septic peritonitis differs from the purulent in that it is younger and may become purulent.
(f) Fibrino-plastic, when there is a little more fibrinous material.
(g) Fibrino-purulent, local or circumscribed.
(h) Chronic peritonitis, the most common, the tubercular form.

What are the causes of peritonitis?
With the exception of the plastic form, they are all considered as proceeding from infection.

Mention some sources of infection to the peritoneum.
1. Extravasation, from (a) intestinal canal; (b) liver and gall bladder, (c) urinary organs, (d) female generative organs, either infection directly through the walls of the uterus or ends of the tubes, (e) psoas or lumbar abscesses. 2. Necrosis, as strangulated hernia, twists or want of blood supply to the intestine; gangrenous pancreatitis or splenitis due to thrombosis, fat necrosis, ovarian tumors, movable kidney and spleen. 3. Dirty hands and instruments, stabs, missiles, etc. 4. Through the circulation from gonorrhoea, rheumatism or syphilis, etc.

What is the characteristic pain of peritonitis?
It may be general or localized, more frequently referred to the epigastrium. It is a sharp lancinating pain, which is paroxysmal. The disappearance of the pain during peritonitis is a very bad symptom. Tenderness is very characteristic and of much diagnostic value; it is more frequently localized than general. The result of tenderness is a boardlike rigidity of the muscles of the abdomen. That this rigidity is involuntary can best be seen by diverting the patient's attention.

What symptoms will you get on palpation and percussion of the abdomen?
Distention, arrest of peristalsis, arrest of rumbling, constipation.

What is the characteristic vomiting of peritonitis?
Vomiting is an early symptom. At first it is irritating and beneficial, as it unloads the stomach; this stops as soon as the stomach is empty.

If the constipation is kept up for a long time we have vomiting of bile and liquid faeces; this is simply a bubbling over and is to be counted among the dangerous symptoms.

What is the peculiar facial appearance of peritonitis?

Facies abdominalis. Hypocritic face. It is a peculiar, anxious look of the face with restlessness. If recognized early it is a very valuable symptom.

Give characteristics of the temperature, pulse and respiration in peritonitis.

Temperature is worthless; in the beginning it usually rises, but when the peritonitis gets worse the temperature falls.

Pulse is of more value; if it gets stronger, harder and slower, we can be pretty sure that the case is getting better, or vice versa.

Respiration is usually superficial and hurried and is mostly of the chest breatning variety.

What medicinal measures are used in the treatment of peritonitis?

(a) Employment of opium to splint the intestines.

(b) The use of cathartics to unload the intestines. They should be used before vomiting begins; and if there is no perforation of the bowels.

(c) Enemas.

Mention the various kinds of enemas employed.

(a) glycerine, (b) white of egg and water, (c) glycerine and water, (d) compound enema consisting of

R

Magn. sulph., oz. ij.
Glycerini puriss., fl. oz. ij.
Ol. Terebinth, fl. oz. ss.
Aqua bullientis, q. s. rd. fl. oz. jv.
M.
Sig. Use while hot as an enema.

This will be for twenty-four hours. At the end of the second day start with a purge.

R

Calomel, 1-5 gr.
Aloin, ½ gr.
Soda Bicarb., 1 gr.

What is the surgical treatment for peritonitis?

(a) Remove the cause—foreign body, perforation, etc. See each section.

(b) Remove the effects; this is done by incision, irrigation and drainage.

What is the incision for peritonitis?

If there be no localized pain, then make an incision in the median line. If there be localized pain, make an incision over the seat of it. If it is general peritonitis, make an extensive T-shaped incision. There is no limit as to the extent and number of incisions. If the peritonitis be localized mops may be used, but if it be general, irrigation and drainage may be used.

What is the after treatment of peritonitis?

That of any laparotomy. Put the patient to bed and try to avoid reverse peristalsis. Give nothing by the mouth except small pieces of ice to allay the thirst; the water from the ice must be expectorated. A pound of water containing some salt, injected per rectum, will allay

the thirst excellently. Re-establish peristalsis by enemas; twelve hours after the operation begin with enemas and inject high up in the rectum by means of a tube. Glycerine is preferably used here. This is followed by a compound enema. Use calomel, which will stay down on account of its weight.

What are the infective sources of tubercular peritonitis?

(a) Urinary tract. (b) Intestinal tract. (c) Female generative organs. (d) Acute miliary tuberculosis, (e) Mesenteric glands, (f) Circulation.

What are the varieties of tubercular peritonitis?

(a) Tubercular ascites, (b) dry tubercular peritonitis, (c) fibrinous (plastic) tubercular peritonitis.

What are the characteristics of tubercular ascites?

A considerable amount of serous effusion, feeling like a cyst. The effusion is slightly turbid, containing some whitish flocculent matter.

What are the characteristics of dry tubercular peritonitis?

Fluid is absent, adhesions form and the intestines are usually matted together.

What are the characteristics of fibrinous tubercular peritonitis?

Caseation with an abundance of fibrin. Secondary tubercular changes take place, such as ulceration. It is therefore often known as ulcerative peritonitis.

What are the symptoms of tubercular peritonitis?

Emaciation of patient, digestive disturbances, mucous stools, diarrhoea and constipation alternating, a certain amount of fever. Frequently it can be recognized by the presence of tubercular nodules. Pain, tenderness.

What is the surgical treatment for tubercular peritonitis?

(a) The ascitic form is really the only form followed by any good results. Make incision, and drainage of long duration. (b) If there are any abscesses they should be opened and drained. (c) In the adhesive form surgery is absolutely useless, the patient usually dying after the operation.

SURGERY OF THE STOMACH.

What is the name of the surgeon who introduced surgery of the stomach?

Rydygier.

Give pathology of ulcer of the stomach.

It seems to be an ischaemic necrosis, and is probably due to the blocking up of an end artery. Consequently ulcers have usually the shape of a cone, the base being at the mucus membrane. Slough forms which may be digested. When vessels are injured hemorrhage may occur, which may result in death. Frequently, however, a perforation occurs. The peritoneum may cover the opening, glueing it over. In other cases the food accumulation is emptied into the abdominal cavity and a rapidly developing peritonitis or abscess causes death of the patient.

On what portion of the stomach is the ulcer least dangerous?

On the posterior portion. It scarcely moves; therefore the ulcer is less dangerons. It is the most common, but the most difficult for the surgeon to reach.

At what age and in what sex are ulcers of the stomach mostly found?

In young adult females.

What conditions may follow the healing of an ulcer?

Constrictions or strictures at the cardiac or pyloric ends due to cicatricial contractions; or hour-glass contractions, if the ulcer involves the body of the stomach.

What are the symptoms of ulcer of the stomach?

Pain of a boring nature going through and through. There is a fixed point of tenderness and the painful spot goes directly through to a corresponding spot in the back. Pain is relieved by eating. Soon vomiting follows, which may be associated with clear red blood, showing that a large vessel has been eroded, or coffee-ground blood when a small vessel has been opened. Tarry stools.

What are the indications for surgical treatment in gastric ulcer?

Acute haemorrhage, passive haemorrhage, persistent progressive anaemia, peritonitis, abscess (subphrenic).

What is the operation for gastric ulcer?

Gastrectomy. Make an incision in the median line, one that can be enlarged in any direction. The anterior surface of the stomach is examined first; if a perforation is found, infold and suture with a Lembert suture, or cut out the ulcer and unite with a Lembert suture. Hemorrhage should be controlled with a stick around stitch. Prevent adhesions between stomach and abdominal walls by means of packing.

What causes gastric fistula?

Gastric ulcers or perforating wounds.

What is the treatment for gastric fistula?

At times they heal spontaneously; if not, use the actual cautery, or cut out the edges and unite.

Where are strictures of the stomach mostly found?

(a) At the pyloric orifice; (b) at cardiac end, due to swallowing of foreign bodies; (c) hour glass contractions in the body of the stomach; also due to gastric ulcers, as in pyloric orifice.

Give causes of strictures of the stomach.

(a) Congenital malformations, (b) Ulcers, (c) Tumors (nearly always carcinoma), (d) Twists of the pylorus, (e) External pressure upon the pylorus, by abscess or tumor of the liver, and gall bladder, or a twist produced by a floating kidney, (f) Spastic stricture.

Give the symptoms of gastric strictures.

Dilatation of the stomach; frequently a history of gastric ulcer; vomiting of food taken days before. Malnutrition.

How would you recognize dilatation of the stomach?

First by its shape, or we may fill it with fluid and make percussion; you may elicit succussion. You can cause effervescence by means of a Seidlitz powder and then outline the stomach.

Describe the palliative treatment for stricture of the stomach.

Wash the stomach; use galvanism and massage.

Give surgical treatment for stricture of stomach.

Gastrorrhaphy. This is done to reduce the size of the dilated stomach, or we may direct our attention to the stricture itself by mechanical dilatation. (b) By a plastic operation as pyloroplasty. (c) By taking out a portion of the pylorus (pylorectomy). (d) By directing the flow another way (gastro-enterostomy).

What is gastrorrhaphy or the operation of Biechner-Weir?

It is the infolding of the stomach in order to lessen the capacity of a dilated stomach. One or more rows of stitches may be put in.

What operation may be used in case of hour glass contractions?

Gastrostomy.

What is gastrostomy?

It means the making of a permanent mouth in the stomach for the purpose of placing food in the stomach. This was first done in 1874 for stricture of the oesophagus. Make an oblique incision along the border of the left rib. The peritoneum of the stomach is then sewed to the parietal layer, and, several days afterward, the stomach is opened. The great difficulty is the keeping of food in the stomach during digestion, but this can be overcome by the operation of Witzel.

Describe the operation of Witzel.

Make an opening in the stomach and introduce a tube. The latter is surrounded by the walls of the stomach for some distance, so that a long channeled fistula results.

What is Loreta's operation?

It consists in preliminary gastrotomy and digital or instrumental dilatation of either the cardiac or pyloric ends of the stomach. It is useful for non-malignant strictures and was first introduced in 1882.

What is pyloroplasty?

It is the operation of Heinecke-Miculiz. It consists in making a longitudinal incision into the pylorus and transforming it into a vertical wound. Some operators prefer a diamond-shaped cut.

What is pylorectomy?

It is the partial removal of the pylorus; the ends of the stomach and the duodenum being united by a suture. It was first done by Billroth in 1881, but the mortality was 70 per cent.

What is gastrectomy?

This is a cutting out of a part of the stomach as for ulcer.

What is gastro-enterostomy?

This operation is done to direct the normal current in another direction, and is mostly used for malignant growths in the pylorus. A mouth is made into the stomach and part of the intestine united by means of a Murphy button. The diseased pylorus should not be removed.

What is gastrotomy?

It is an opning into the stomach either preliminary to something else or for the removal of foreign bodies. The incision is usually made in the median line, with a longitudinal incision in the stomach. usually midway between the two curvatures. This was first done in 1602, in Bohemia.

What kind of foreign bodies are usually found in the stomach?

Teeth, spoons, needles, introduced from the mouth, or some may accumulate in the stomach on account of vitiated taste.

Give symptoms of foreign bodies in the stomach.

Very variable. As a rule the symptoms are those found in inflammations. The foreign body may produce an acute stricture, and its consequent symptoms. Diagnosis can often be confirmed by the X-Rays.

Give treatment for foreign bodies in the stomach.

Potato or bread treatment is the best. These are supposed to surround the body and carry it off without injury to the parts. Surgical

treatment is that of Billroth, of Vienna—Make an incision in the stomach and remove the body. Operate when there is pain, tenderness, fever, obstruction.

What varieties of tumors are found in the stomach?

The most common one is the schirrus or hard carcinoma; adenoma, fibroma, fibro-myoma, and rarely sarcoma.

What are the symptoms of tumor of the stomach?

Those of stricture and ulcer: Progressive anaemia and cachexia (emaciation in ulcer) vomiting, haematemesis of digested blood (coffee-grounds). We may find a chemical diminution of muriatic acid. There may be a tumor, but when this is felt it is too late to operate. Pain in tumor differs from that in ulcer in that it radiates to the shoulder, while the pain in ulcer goes directly backward to a point corresponding to the one to which patients point in front. Tumor pain is worse from food; that of ulcer is relieved by food. Tumor causes dilatation and stricture much sooner than ulcer.

Describe treatment for carcinoma of the stomach.

If perforation or abscess, make same incision as for ulcer. The general condition rarely allows an exteusive operation. Two operations are chiefly used—(a) pylorectomy, (b) gastro-enterostomy.

What is the preliminary treatment for such an operation on the stomach?

(a) Wash and clean the stomach; use a stomach tube; (b) feed per rectum.

What sutures are used for suturing stomach and intestines?

(a) Lembert suture, going through all the coats except the mucous membrane.

(b) The Czerney-Lembert suture, in which the mucous membrane is sewed together first, followed by Lembert suture.

SURGERY OF THE INTESTINE.

How is bowel obstruction generally divided?

Into acute and chronic.

Mention the five most important symptoms of bowel obstruction (acute).

Pain, vomiting, constipation, distention, collapse.

Describe the characteristic pain of acute bowel obstruction.

It is usually sudden in onset, its severity varying in proportion to the amount of bowel involved. As to its location, it either corresponds to the seat of involvement, or is general. It may also be referred to the solar plexus. When due to the attempt of the intestine to re-establish peristalsis it is cramp-like, or colicky. It may also be due to inflammatory action, and may disappear entirely when peritonitis is established.

Describe the characteristic vomiting in acute bowel obstruction.

It is reflex. It is especially severe when the small intestines are affected. Finally there is bilious and stercoraceous vomiting. It is copious, continually stercoraceous and projectile.

Describe the characteristic constipation of acute bowel obstruction.

It is absolute at first; but if the lower ileum is involved we can overcome it by enemata. We may have an irritant diarrhoea, or constant straining instead of the constipation.

Describe the distention in acute bowel obstruction.

It is more marked when the large intestine is obstructed. We are apt to feel coils of intestine, gurgling and occasionally a tumor.

Describe the collapse in acute bowel obstruction.

It is, at the time, severe as in cholera. There is a sudden feebleness and a subnormal temperature. It is due to the injury of the nerve through pinching of the bowel. The small intestine is more sensitive.

Name some concomitant symptoms of acute bowel obstruction.

Tenderness; not marked at first, but coming on after inflammatory change. It is localized, later diffused, and causes rigidity. Intense thirst; which is present in all abdominal operations. Tongue; dry and brown. Breath; offensive and faecal. Later we have symptoms of peritonitis or those of auto-intoxication, exhaustion and death within a week.

The onset is more gradual. Vomiting is irregular. Constant nausea is very characteristic. Constipation is immediate and intermittent and can at first be relieved by purges. Purges, however, aggravate later on. There is an irritant diarrhoea. Distention is variable; patient swells up like a drum, a little gurgling occurs and the abdomen is soft again. The symptoms become more severe until they become acute.

What is the prognosis of acute bowel obstruction?

Not good. Patient usually dies in one week.

How do the symptoms of chronic bowel obstruction differ from those of the acute variety?

What prognosis would you give in a case of chronic bowel obstruction?

Death in six months, usually, due to starvation, auto-intoxication, peritonitis, perforation.

Give the differential diagnosis of obstruction in small and large bowel?

a. In small intestine the pain is great and the vomiting early, copious and persistent. There is not much distention, and collapse is quite common. There may be a little diarrhoea.

b. In large intestine it is usually chronic, the vomiting comes on late, and constipation and distention are marked; and, if in sigmoid flexure, we can feel "ballooning" by introducing the finger into the rectum.

What are the causes of acute bowel obstruction?

Mechanical obstructions, such as intussusception, 35 per cent.; volvulus, 5 per cent.: strangulation, kinks and bends, 25 per cent.: foreign bodies and 5 per cent. enteroliths.

What are the causes of chronic bowel obstruction?

Strictures, 15 per cent.; tumors on the outside, 5 per cent., or within, 4 per cent.; faecal accumulations, 6 per cent.

To what is passive bowel obstruction due?

Paralysis of the intestinal wall, peritonitis, local injury, shutting off of the blood supply, embolism or thrombosis.

What is intussusception?

It is a telescoping of one part of the intestine into the other.

What are the three parts of an intussusception?

a. Intussuscipiens (receiving). b. Intussusceptum (being received), and c, neck.

Where do intussusceptions usually occur?

At the ileo-coecal valve; 44 per cent. of all occur here. Some at the ileum (8 per cent.) and some at the colon (colic) (18 per cent.); or one part of the intestine with the other (enteric) (30 per cent.). They are all usually single, but may be multiple.

Which part is the lower, the intussusceptum or the intussuscipiens?

The intussuscepiens as a rule, excepting after death.

What is nature's cure for intussusception?

The intussusceptum becomes inflamed, contracted and gangrenous.

Give the symptoms of intussusception.

This condition is almost always found in boys under ten years of age. Next in frequency in adult females. It is usually caused by eating something unsuitable or indigestible. It causes a tumor like a sausage (50 per cent.), which at times protrudes through the anus. There is usually constipation and straining (55 per cent.), the patient passing mucus and blood (80 per cent.). Also symptoms of acute bowel obstruction, the vomiting being inconstant, because faeces can pass through at times. Sudden onset, pain severe then relieved, intermittent then continuous with exacerbations, occasionally localized.

How would you diagnose chronic intussusception?

It has no characteristic symptoms. This condition is usually discovered on opening the abdomen for supposed bowel obstruction.

How would you treat intussusception?

If you do not see it within twenty-four to forty-eight hours let nature carry out its own treatment; in this way 40 per cent. are eliminated and 40 per cent. get well. Perforation or stricture may cause death. Use morphia to reduce peristalsis, and try to reduce by enemas. Never use purges. Early section; reduction (two-thirds recover), or resection, making an artificial anus; or, enterostomy (all very fatal).

Give the causes of intussusception.

Adhesions, strangury of omentum, adhesive bands of other organs. Meckel's diverticulum. Slits in omentum, mesentery or broad ligaments or shrinking of the mesentery.

Where do internal herniae occur?

At the foramen of Winslow, through the diaphragm, or the hernia may be recto-peritoneal, or through the obturator, or greater sacrosciatic foramina.

Give the symptoms of acute internal strangulation.

It usually occurs in young adult males below the age of forty (seventy per cent.). The symptoms are sudden in onset. There is early pain usually umbilical and persistent; marked collapse; vomiting, early, severe and not relieving, stercoraceous by the fifth day; constipation, no tenesmus, blood or mucus; distention varies, usually not marked (third day); no tumor; no dullness; no rigidity.

Give the treatment for internal strangulation.

Put the patient at rest, and treat for collapse. Give heart stimulants, strychnine, glonoine, digitaline, normal salt infusion. After deciding the plan of treatment use morphia.

Would you allow the patient to satisfy his thirst in internal strangulation?

Yes. It will wash and cleanse the stomach and patient will vomit anyway.

Where do we find congenital atresiae of the intestine?

It rarely occurs in the ileum, jejunum or duodenum; oftener at the ileo-caecal valve, and more often in the rectum and anus.

What is a volvulus?

It is a twisting of the intestine on itself or its mesentery. It is quickly fatal from gangrene of the bowel.

Where is volvulus most frequently found?

At the sigmoid flexure, because it has a natural twist. Occasionally in small intestine from adhesions.

What is the predisposing cause of volvulus?

Chronic constipation, with local laxity in the sigmoid, causing stretching of the meso-colon.

Give the symptoms of volvulus.

Usually found in males between the ages of fifty and sixty. The onset is sudden. There is umbilical pain, early and intermittent, or with exacerbations and then localized with tumor; vomiting, early or late, according to the location of the volvulus; constipation, no blood or mucus; ballooning and occasionally tenesmus of the sigmoid. Distention is early, beginning at the sigmoid and working across and upward to the right.

What is the treatment for volvulus?

Open the abdomen and try to untwist. If this cannot be done, then empty the bowel and try again; if this fails, then make either an artificial anus, if low down, or resection of the bowel, if high up; or an artificial anus in the sigmoid.

What are the two varieties of intestinal stricture?

a. Cicatricial, found in the young. b. Malignant, found in older patients (over forty years of age).

What are the common causes of intestinal strictures of the cicatricial variety?

Dysentery, syphilis, traumatism, tuberculosis.

Why are typhoid lesions not so likely to produce strictures?

Because they do not extend around the intestine, but are parallel to the longitudinal fibres.

Mention the varieties of tumor found in the bowel and give their usual location.

Adenoma, myo-fibroma, angioma, sarcoma, lympho-sarcoma. They are found especially in the rectum, colon and lower ileum (children).

Mention the varieties of tumors found outside the bowel.

Displaced womb, fibroids, ovarian and renal tumors, abscesses, movable spleen, cancer, especially in females.

Where are strictures resulting from these causes usually found?

Dysenteric in the lower colon; syphilitic in the rectum; tubercular in the lower ileum; traumatic anywhere.

What are the causes of malignant strictures and where are they found?

Cylindrical epitheliomata. They are found in the caecum, flexures, sigmoid, and in the rectum just above the anus.

Give the symptoms of strictures of the small intestine.

These strictures are usually cicatricial and occur in early and middle life. There is previous history of tuberculosis, traumatism, hernia and operations on the intestines. The course is irregular. There are

varying attacks occuring more frequently and with greater severity. Finally there is complete obstruction. These attacks are induced by indigestible food or drastic purges. There is pain, early vomiting, variable distention (visible coils) and constipation.

Give the symptoms of strictures of the large intestine.

They are usually the result of malignant growths. The course is irregular; the large intestine is less affected by improper foods or purges. There is constipation, or a bloody diarrhoea and late vomiting.

In what persons do you find foreign bodies in intestinal tract?

In children, hysterics and the insane.

Where are such bodies usually located?

Ileo-caecal junction or lower rectum.

How do foreign bodies get into the intestinal tract?

a. From without, through the mouth.

b. Formation within as the formation of an enterolith around a cherry stone, or around a gall stone, or indigested nucleus, or insoluble fibres, causing formation of avenoliths or oatstones.

Give the symptoms of a foreign body in the intestines.

Those of complete bowel obstruction. History of foreign body or gall stone. Onset gradual usually. Occasionally can feel foreign body

What is the treatment for foreign bodies in the intestines?

Relax the intestines by means of opium. If there be obstruction, make an incision and remove the foreign body. Resection may be required or the making of a temporary artificial anus.

What is ileus paralyticus?

Another name for impacted faeces.

Where are impacted faeces mostly found?

At sigmoid flexure, caecum and transverse colon.

What are the causes of impacted faeces?

Dyspepsia and habitual constipation, habitual purging, indigestible food, lost muscular power of the intestines, from age or disease, loss of teeth, or insufficient mastication.

What may result from impacted faeces?

Chronic obstruction, then supervening acute obstruction.

What symptoms result from impacted faeces?

A recurring tumor (caecum, sigmoid and transverse colon), doughy, tender (ulcer). Pain is intermittent; later, worse from purges. Recurring and increasing constipation (no tenesmus, blood or mucus). Vomiting variable (not faecal unless complications).

What is the treatment for impacted faeces?

Use no purges. Must soften, loosen and break up. Give enemeta of warm water, soap, or sweet oil, with patient in knee-chest position. It may be necessary to dig out the faeces. Massage, faradism.

What is understood by intestinal paresis?

It is an adynamic condition of the bowels, or an arrested peristalsis.

What are the surgical resources in bowel obstruction?

Stomach irrigation, enemata, insufflation (Senn), manual exploration of rectum (Simon), Faradism, uniform continuous compression of the abdomen, intestinal puncture, abdominal section, enterotomy with introduction of purge, enterostomy (Nelaton), colostomy (Amussat), resection or end to end union, side to side union or lateral approxima-

tion, lateral implantation, lateral anastamosis, enteroplasty, jejunostomy.

What is the use of stomach irrigation?

It overcomes vomiting and cleanses the stomach. May be used at the end of abdominal operations, then four (4) ounces of magnes. sulphate, which will act as a purge, may be left.

How do you administer enemata?

Use a rectal tube or catheter, so that the injection is carried high up (about eight inches). It may be assisted by the knee-chest position.

For what can hydrogen gas be used, and what is its disadvantage?

It has been used to diagnose small perforations in the intestines. Its disadvantage is its excessive distention.

What is the use of massage and Faradism in abdominal surgery?

It is good in cases of paralysis, impacted faeces and chronic constipation. With massage the gas in the intestines can be pressed out.

What is the disadvantage of treatment by uniform pressure?

It is used to prevent distention, which will, however, go on and cause pressure in the direction of the least resistance, which may be injurious.

What is the disadvantage of intestinal puncture?

It often produces hemorrhage, perforation and sepsis, and will do no good, as you are unable to press out all the gas contained in the intestines.

Give indications for abdominal section.

It is called for when we are sure of the presence of an abdominal obstruction or of any septic process in the abdominal cavity.

What is enterotomy?

It is a temporary incision into the intestine to allow gas to escape, etc., and is closed immediately afterward.

What is enterostomy?

It is an opening into the intestine preserved for a greater length of time.

What is the enterostomy of nelation?

It is especially called for when we are sure that the obstruction is near the beginning of the colon, or the end of the ileum. The operation can be done under cocaine. Incise the abdomen and then find the intestine which presents itself first, as it is usually the one nearest the obstruction; therefore the most distended and the uppermost one.

In what do colostomies differ from enterostomies?

In colostomy the mouth is made into the colon, especially the descending colon, and sigmoid flexure, usually at the left side; while enterostomy may be performed at almost any point along the small or large intestine.

Describe the first colostomy done by Amussat.

This was done in the pre-antiseptic days, and the incision was made in that part of the colon where it was not covered by mesentery; it therefore corresponds to our method of operating on the kidneys.

What were the disadvantages of this operation?

Frequently anatomical peculiarities were found, in which the colon was entirely covered by mesentery, and at times the dueodenum was mistaken for the colon, so that the patients died of starvation.

Describe inguinal colostomy.

An incision is made on the left side at right angles to the umphalo-spinal line, two inches inside of the spine. The colon is drawn out through the incision, or placed over a glass rod. It can be temporary or permanent.

How does the colostomy of Maydl differ from the above?

He tries to form a sphincter by preserving the fibers of the different layers of the muscles of the abdomen.

How does the incision in the intestine differ in temporary and permanent colostomies?

If only temporary make a longitudinal cut; if permanent a transverse incision is made. If you are afraid of bleeding make the opening with a hot iron. Pack cavity in temporary operation, and stitch it to the parietal layer of the peritoneum when permanent.

How can you prevent hernia of the colon in case of colostomy?

At times the mucous membrane of the incised colon turns inside out. This can be prevented by drawing the colon down, until its mesentery is tense.

Describe end to end union.

A piece of the intestine and a triangular piece of mesentery is removed; the incision should bevel outward, so that the intestine has sufficient blood supply. Then unite mesentery and intestine. The latter either by Murphy button or Lembert suture.

Describe lateral approximation.

It is done by closing the ends of the intestines, cutting openings in the sides and uniting these openings again.

What is lateral anastomosis?

This is a good operation to shorten the faecal current, without removing the obstructed portion. Simply unite the intestine above and below the obtsruction.

What is lateral implantation?

Close the stump of the ileum and open the colon above the ileo-caecal opening and unite the ileum to it.

What sutures are used on the intestines?

LEMBERT, which is a suture approximating the peritoneal surfaces of the intestines. It is an interrupted one.

GLOVERS, the same as Lembert, but continuous.

CZERNEY-LEMBERT, approximate first the ends of the mucous membrane; then finish with a Lembert suture.

What materials are used to support such sutures?

Senn's bone plates, cat-gut rings, drainage tube rings (Van Lennep's), and Murphy buttons.

How many universally accepted methods of uniting intestines are there?

Two. Czerney-Lembert and Murphy buttons.

What method is usually accepted in lateral approximation?

The method which consists in first putting a suture around the openings of the intestines, going through the whole wall, and then in suturing the peritoneal surfaces together.

What is enteroplasty?

It is a longitudinal incision into an intestine, which is transformed by a suture into a vertical cut; practically the same for the intestines as pyloroplasty for the pylorus.

What is a faecal fistula?

It is a passage from the intestinal canal, which may communicate with the outside; or another intestine (anastomotic fistula).

Differentiate between fistula and artifical anus.

A small opening is a fistula, a large opening is an artifical anus. Through a fistula only a portion may pass; through an artifical anus all must pass.

Classify the most common fistula.

There are six.

1. Opening from the intestine through the abdomen, in which case the intestine is closely adherent to the abdominal wall.
2. The intestine is farther away from the abdomen, and communicates by means of a sinus, which may be straight, tortuous or multiple.
3. Those in which there is a deflection of the gut with a large opening or spur or diaphragm.
4. Those with multiple openings.
5. Congenital (umbilical, vesical, urethral, vaginal).
6. Anastamotic.

What is an eperon?

It is a spur. The third variety of faecal fistula may be considered as an eperon.

Mention the most common causes of faecal nstula.

a. Those due to wounds and operations. b. Those due to ulceration. c. To tuberculosis. d. To carcinoma. e. To strangulated hernia. f. To appendicitis. g. To ultra-peritoneal abscess. h. To tubercular peritonitis.

Give the symptoms of faecal fistula.

Some of the intestinal contents escape. The higher the fistula the greater the marasmus, and the more irritating the discharges to the skin.

Describe the treatment of faecal fistula.

Some forms are inoperable, viz.: fistulae from tuberculosis and cancer. Those far from the abdominal wall and those with mutiple openings, especially in children. Fistulae following hernia are apt to heal spontaneously, especially from femoral. Caecal fistulae are especially hard and dangerous to operate. Enterotomy may be employe and a drainage tube used (8 per cent. mortality two-thirds cured). In general, give diet having little residue, such as predigested meats.
or a resection may be done (38 per cent. mortality) four-fifths cured.

On account of irritative discharges, protect the skin with aristol or oily substances.

What are the two different operative methods for fistulae with spurs?

(a) Dupuytren's enterotomy. This consists in shoving down and eradicating the spur.

(b) The rubber drainage tube method, which destroys the spur through the elastic pressure of the tube.

Mention some other methods for the treatment for faecal fistulae.

(a) Resection of the intestine. This has 40 per cent. of mortality. (b) Freshen the edges and suture layer by layer. (c) Dissect intestines free and stitch up.

What are the symptoms of intestinal perforation by ulcers in typhoid fever?

Those of typhoid fever plus sudden onset of peritonitis and collapse.

Sometimes adhesions take place and a localized suppurative peritonitis results. (Pain, tenderness, rigidity, distention, shock).

What is the rule for operation in perforation of typhoid ulcers?
If collapse is not extreme, exploration is permissible. If extreme, wait.

What cases of typhoid fever perforations are most favorable for surgery?
Those in which localized suppurative peritonitis develops.

SURGERY OF THE OMENTUM AND MESENTERY.

What is the most interesting point about the omentum?
Its disposition to the formation of adhesions.

What is the disadvantage of omental adhesions?
The omentum usually goes through the opening of hernia, inviting the intestines constantly to follow. In abdominal sections, spread the omentum over the intestines to prevent formation of adhesions between intestines and abdominal wound.

What pathological conditions are met in the omentum?
Abscesses, cysts, carcinomata, haematomata, and tuberculosis.

What is the treatment for an omental growth?
Excise, or incise and pack.

What symptoms characterize an omental growth?
It does not move with respiration; it is superficial and easily movable.

What is the most common lesion in the mesentery?
Tuberculosis beginning in the mesenteric glands, which may either be localized or diffused.

What is the treatment for a localized tuberculosis of the mesentery?
Resect the overlying intestine and remove the corresponding portion of the mesentery.

What other lesions are found in the mesentery and in what kind of persons?
Embolism and thrombosis, especially in persons suffering from chronic Bright's disease.

What are the symptoms of embolism of the mesentery?
Sudden localized agonizing pain. May have bowel obstruction and collapse on account of paralysis of the intestines. Peritonitis.

For what are cysts of the mesentery often mistaken?
For ovarian cysts and cysts of the kidney.

SURGERY OF THE PANCREAS.

Mention the varieties of inflammations of the pancreas.
Acute haemorrhagic, suppurative or gangrenous. Chronic or sclerotic, which consists in an increase of the connective tissue.

Give the symptoms of acute suppurative pancreatitis.
They are likely to be referred to the liver or stomach. Differentiate from tumor of the stomach by distending the latter. Inconstant fever; jaundice often; glycosura, ascites and oedema, emaciation. Symptoms

of bowel obstruction, death following quickly when very acute from rupture.

What can be said of acute haemorrhagic pancreatitis?

It is often mistaken for acute perforating peritonitis or acute intestinal obstruction. It is usually fatal and operations are useless. If the individual lives for a day or two there is usually pus formation.

What are the causes of acute suppurative pancreatitis and mention the varieties.

They are usually the result of infection, calculi, round worms, wounds injuries, cysts, from neighboring organs (ulcer of stomach, duodenum, etc.). Varieties: Peripancreatitis, parapancreatitis, intrapancreatitis. They usually occur in persons under forty.

Give the treatment for acute suppurative pancreatitis?

Care should be taken to prevent peritoneal contamination. A median incision is made and the omentum incised or torn through, care being taken to avoid injuring the colon or stomach. Protect the viscera around the seat of the lesion and draw off a portion or all of the contents of the tumor. Thoroughly irrigate and drain, using drainage tube and gauze, removing these when suppuration has ceased.

Describe gangrenous pancreatitis.

It is one of the results of acute pancreatitis and is a virulent injection. It is occasionally cured spontaneously by sloughing into the intestine. Fatty stools and jaundice are prominent symptoms. It may be treated by free incision, exploration, removal of the dead structures, and drainage. It may be treated by cholecystenterostomy.

Mention some other pathological conditions found in the pancreas.

Calculi, which cause obstruction. Cysts, retention, calling for incision, Sarcoma, rare. Caricoma, usually secondary.

What are the methods of attacking the pancreas surgically?

Either incision through the median line, where it is necessary to go through the lesser peritoneal cavity, or through the back, where we avoid the peritoneal cavity.

SURGERY OF THE SPLEEN.

What condition of the spleen is amenable to treatment?

Infection and formation of abscesses.

To what is gangrenous splenitis due?

To infarcts or emboli (septic), infection from injuries or through the circulation from neighboring organs, typhoid malaria.

What is a wandering spleen?

It is a loose and frequently hypertrophied spleen. It is likely to go anywhere in the abdominal cavity.

What are some of the surgical difficulties in operating on spleen?

There is a great deal of haemorrhage. The spleen cannot be sutured.

What is spleno-pexis?

An incision is made along the lower rib of the left side. The spleen is brought into natural position and a suture carried through, one end of which is fastened to a piece of gauze on the back, the other to one in front. Scarify the parietal layer of peritoneum and splenic peritoneum to produce adhesions. The suture is removed after 8—10 days.

What is splenotomy?
It is a cutting into the spleen.

What is splenectomy?
It is the partial removal of the spleen for hypertrophy or overgrowth of that organ.

When is it contra-indicated?
When there is a hyperaemia or leucaemia or a malignant tumor in the young.

Where is the incision made for the spleen and why?
Along the border of the lower ribs of the left side, because here it can be prolonged if necessary to find a wandering spleen.

What are the symptoms of a splenitis and what is the prognosis?
Enlargement and tenderness with symptoms of abscess. The prognosis is usually fatal before recognition.

SURGERY OF THE LIVER.

Give the anatomy of the liver.
It is the largest gland of the body, situated in the right hypochondriac region, in the concavity of the diaphragm. The right lobe is the larger, the left the smaller, and extends beyond the median line, and is beveled. The area of dullness can be elicited by percussing between 6-8 ribs. It rises and falls with respiration and in thin subjects may sometimes be examined.

Describe the gall bladder.
It is four inches long and one and one-half inches wide. It is attached loosely to the under surface of the liver by peritoneum and fat. Its base extends out at the anterior surface of the liver, and is in contact with the ninth cartilage. The neck and part of the body are covered by peritoneum, reflected over from the liver. When the gall bladder is enlarged it can be easily felt as a fluctuating ball. Normally it contains one fluid ounce.

How would you palpate the liver?
Put the patient in a chair without a back and let him lean over. This relaxes the abdominal muscles. Stand behind the patient and you can easily feel the gall bladder while palpating the liver.

Name some of the surgical conditions of the liver.
Wandering liver (women 80 per cent.) displaced anywhere. it may herniate through the chest cavity, or through the abdomen. Abscess, traumatic or tropical.

What are the symptoms of a floating liver and what is the treatment?
Dyspepsia, nausea, vomiting, cyanosis, occasionally jaundice, the shape of the tumor, tympany in liver and dullness, ease of replacement. Treatment: Reduce and bandage in position.

From where does infection of the liver come?
(a) General systemic circulation, (b) Portal circulation, (c) Gall duct.

Mention the different varieties of abscess.
Traumatic, solitary or tropical, multiple, embolic or pyaemic.

What are the causes and symptoms of abscess of the liver?
They are caused by gall stones or suppuration in the bile duct; by foreign bodies; and by round worms from the intestinal tract.

Describe tropical abscesses.

They are single or double, but never multiple. Seventy per cent. occur in the right lobe. They are usually of dysenteric origin.

What are the causes of multiple abscesses of the liver?

They are secondary to some other focus elsewhere, viz., gastric or typhoid ulcers, fissure or ulcer of the rectum, from head injury or operation, occasionally from abscesses along the gall ducts, or from a pylephlebitis with general pyaemia. They are rarely from carcinoma.

Mention the symptoms of abscess of the liver.

They are often obscure. There is usually a hectic flush, rigors, sepsis, sweating, occasionally enlargement (especially the right lobe), tenderness, pain (especially referred to the right shoulder). Jaundice is rare.

What is the treatment of liver abscesses?

The traumatic and solitary abscesses are alone amenable to treatment and operation generally gives good results. Incise and drain. Allay haemorrhage by packing.

Describe hydatid cysts of the liver.

They are rare and are caused by parasites coming from the intestine by the portal vein. Their growth is slow (4—25 years). There are often no symptoms. They may calcify. Rupture may possibly occur into the lungs or plurae, the peritoneum, or even externally, or a cure may result by rupture into the intestines.

Give the symptoms of hydatid cysts of the liver.

Pain and weight, dyspepsia and cough from pressure on the diaphragm, ascites, jaundice from pressure on the bile ducts or portal vein. Suppuration and symptoms of abscess may occur. They usually show enlargement and are painless and tense, and fluctuate.

What is the treatment for hydatid cysts of the liver?

Perform a laparotomy. Aspirate and incise. Suture and pack.

What can be said of simple scirrhus or demoid cysts?

They are rare and may be treated the same way as the hydatid cysts.

What tumors are found affecting the liver?

Carcinomata, sarcomata, angiomata, gummata, lymphomata. These are rarely amenable to treatment. The malignant diseases are usually secondary.

Name the men who studied gall stones particularly.

Courvoisier, Terrier.

What influence has age and sex upon the formation of gall stones?

They are found more in old people and the female sex, 75 per cent. About one in ten shows gall stones at the post-mortem examination. Many cases are thought to be due to tight lacing in women.

What relation has cancer of the gall ducts to gall stones?

In mostly all cases of cancer you will find gall stones or the results of such.

Give the chief causes of jaundice

Obstruction of the different bile ducts.

What kind of jaundice should be particularly well studied and why?

Attacks which are sudden in onset, and have slight symptoms; because there is danger of embolism.

What is characteristic of the haemorrnage in cholaemic patients?
It is a capillary oozing and not dangerous.

Is bile a secretion or an excretion? How much is normally discharged daily?

It is an excretion, because it is superfluous. The normal amount is one pound daily. If the bile is of any use it is to emulsify fat. An eight-hour supply is sufficient to kill, it being nine times as poisonous as urine.

SURGERY OF THE GALL BLADDER AND DUCTS.

What organ is most frequently taken for an enlarged gall bladder? Differentiate.

A floating kidney. Put patient in position for palpation and you can easily detect fluctuation if it is the gall bladder. The kiduey is recognized by its shape. The gall bladder will not altogether slip out of your fingers; the kidney will.

What portions are stained with bile in a post-mortem?

Anterior abdominal wall, transverse colon with its hepatic flexure, the duodenum and the pylorus.

What is the sub-hepatic space?

It is the space between the under surface of the liver and the transverse colon, its outlet being the lateral gutter. (This forms a localization of peritonitis).

Describe the bile ducts.

The cystic duct is one inch in length, and is the outlet of the gall bladder, and with the hepatic duct, which is the duct from the liver, it forms the ductus communis choledochus, which is three inches long and wider than either of the other ducts. The ducts lie upon and in front of the portal vein; therefore, be careful in operating. The cystic duct lies in front of the cystic artery. This has been injured in operating. Be careful also to avoid injury to the ascending vena cava.

Why can not the cystic duct be probed.

Because it presents an angular curve, also because the mucous membrane forms rugae.

Where are gall stones mostly found?

In the gall bladder; occasionally in the liver. They may be forced into the ducts, where their progress is aided by the secretions and the vis a tergo.

What is the supposed cause of gall stone formation?

It is supposed to be due to a catarrh, which causes desquamation of the epithelium and secretion of mucus. This causes a slowing of the current and a deposit of lime salts upon the mucus, which forms a nucleus.

Differentiate between gall stones formed of cholesterine and those formed of lime salts.

Those composed of cholesterine and bilirubin are soft and can easiiy be crushed between the fingers on removal. Those composed of lime salts are harder and whiter.

What is the size, number and color of gall stones?

They may be of any size from a particle of sand to a peach. As to number, one to seven thousand (7000). In color, licorice-green or white.

What are the pathological results of gall stones?

There are usually no subjective symptoms until the stone enters the ducts. The pressure may cause ulcerative necrosis, and it escapes into the intestine or peritoneal cavity, causing peritonitis. They may come out externally. If near the stomach they may be vomited. Bowel obstruction may be caused.

What are the results when the gall stones obstruct the cystic duct?

It causes distention of the gall bladder.

What important symptoms result if the obstruction is in the common duct?

There will be jaundice and enlargement of the liver and gall bladder. This is not common except in stricture and in cancer. If there be no distention of the gall bladder, it is likely that the stone is in the hepatic duct.

If it be in the cystic duct, not pinching upon the common duct, there is no jaundice, but hydrops of the gall bladder or empyaema.

Give the symptoms of gall stones.

Pain begins when the stone enters the gall ducts, it is sudden in onset, and intense. When it is in the common duct the pain is around the umbilicus. There is more or less sensitiveness of the liver and gall bladder. Pain is also referred to the right scapula. Clay-colored stools. Many of the common belly aches are probably due to gall stones, so the faeces had better be examined. Biliary colic, rise in temperature and occasionally rigor.

What are the fever and chills in gall stones due to?

They only occur in very severe cases and are then due to retention and infection of bile.

What are the indications of cholelithiasis?

Persistent intermittent fever and unendurable pain.

What has glycosuria to do with an operation?

Generally it is a contra-indication. Operations on the liver are, however, excepted, and it will soon disappear when the obstruction is removed.

What are the indications for an operation?

Frequent occurence, great severity of the attacks and disablement, sepsis and jaundice. Operation can be recommended as comparatively safe.

What may result if an operation is not performed?

A formation of the morphine habit is not uncommon.

Describe the incision for the removal of gall stones.

The most satisfactory is that in the right linea semilunaris, and is about four inches long. This is supplemented by some operators with a transverse cut, through the rectus abdominalis. Professor Van Lennep prefers the oblique or slanting incision, along the borders of the last right rib.

Is ventral hernia a frequent occurrence after such operations?

No. Because the main pressure of the intestines is below.

What is cholecystotomy?

It is simply an opening into the gall bladder. (a) The "ideal," which is not satisfactory: An opening is made into the gall bladder, and, as soon as it is emptied, it is sewed up and replaced in the abdominal cavity. This is unsatisfactory, because distention will take place and the sutures rupture.

(b) More frequently used because it is yielding better results: Incise the gall bladder and sew it to the abdominal wall and pack it. If the cause is removed by opening, the bile will seek its original channel, and finally the fistula closes. At times we have to make use of plastic measures. The best is to cauterize with hot iron or strong caustics. Examine the faeces and see how much bile is present.

What is cholecystectomy and when is it used?

It is the excision or removal of the gall bladder. The operation is easy if there are no adhesions. Simply tie off the cystic duct and remove by blunt dissection. Only remove the gall bladder when it is diseased by malignant tumors or shriveled up and useless.

What is choledochotomy?

It is an incision into the bile duct, most successfully performed in the common duct. If possible, sew up the opening after removal of the stone, otherwise pack.

What is cholelithotrity?

It is a crushing of the gall stones in the ducts. It should only be done in cases of soft stones that can be crushed by the fingers. Special forceps have been made for this purpose, but damage is likely to result from their use. If the stone is too hard, then make incision and remove it. (This was first done by Tate.)

What is cholecystenterostomy?

The formation of an anastomosis between the gall bladder and a neighboring loop of intestine. It was first recommended by Von Winiwater (Professor Billroth's assistant). The anastomosis can be made by a Murphy button or a Czerney-Lembert suture. It can be done for obstruction of the common duct by stricture, calculi or carcinoma. Always take a loop of intestine near the stomach.

APPENDICITIS.

Give some points as to the comparative anatomy of the appendix.

It is a pouch of intestine in some of the lower animals and also in the foetus. At birth it is very much contracted and is simply a rudiment.

Give the gross anatomy of the vermiform appendix.

The appendix is situated at the lower end of the caecum, where the longitudinal striae meet. It is from one to six inches in length and about one-sixteenth of an inch in diameter. It is made up of the same coats as the intestinal tract in general. Its blood supply is derived from the ilio-colic branch of the superior mesenteric artery, the appendicular artery being an end artery. A small valve (Gerlach's) guards the opening of the appendix. The peristaltic action of the appendix is independent of that of the caecum or colon. Of its coats ,the second of subserous is the thickest and most important from a surgical standpoint.

Describe the mesentery of the appendix.

The appendix has its own mesentery coming from the small intestines, the meso-appendix. Through it it receives its blood supply. From the caecum a small fold is reflected on to the appendix; this, however, contains no vessels.

How does the blood supply to the appendix in the female differ from that of the male?

In the male, it is an end artery; in the female, it communicates with a branch of the right ovarian artery.

Give the position of the caecum.

It is near the kidney, under the liver, during foetal life. Subsequently it descends into the right iliac fossa.

Give some anomalies of the position of the caecum.

It may stay up near the kidneys, in its foetal position; or, it may be pulled down into the pelvis in females.

What are the positions of the appendix?

The normal position is downward and inward. It may be directed straight downward or inward, or inward and upward, or outward, or outward and upward, or forward.

What is the subcaecal fossa?

It is a small space at the end of the caecum. At times the appendix bends up and goes into this fossa.

What is the size of the appendix?

Three to four inches in length; and the size of a goose quill, or the little finger.

What relation have age and sex to appendicitis?

Age: It occurs mostly in the young and young adults (20-30 years).

It is rare in the very young and rare after fifty. This is possibly due to the fact that the opening gets smaller the older the person becomes.

Sex: It occurs more frequently in the male, probably because, in females, it has a double blood supply.

What is the seed theory?

This is an old theory as to the cause of appendicitis, and is now only used by the laity. It is supposed to set up a typhilitis owing to the seed gaining entrance to the appendix.

What is the stercoral theory?

In a large number of cases, hardened faecal matter has been found inside the appendix. It is supposed that faecal matter finds its way into the appendix, and, on account of Gerlach's valve, or kinks in the appendix, it cannot get out again. The walls of the appendix soon absorb the watery constitutents of the faecal matter and a hardened substance is left. The latter causes irritation, pressure, or sometimes interference with the blood supply. Later observations have shown that there is always some soft faecal matter in the appendix.

Dscribe the circulation theory?

We must remember that the appendicular artery is an end artery and has no communication with the capillaries of any other artery. Obstruction, therefore, results in gangrene. Obstruction may occur when the appendix is full of faecal matter and is acutely bent on itself. The communication in the female of the appendicular artery with the ovarian artery may account for appendicitis occurring less frequently in the female than in the male. At the time of menstruation, appendicitis is more likely to occur in females.

Describe the bacterial theory.

Remember that the appendix is a functionless remnant of evolution and has poor resisting power; the expulsive power being poor, because of the poorly developed muscles. It is outside the faecal stream and is therefore a good incubating media, or chamber. It is thought that the bacilli coli communis, which are found abundantly throughout the intestinal tract, get through the mucous membrane into the adenoid tissue,

setting up a spreading inflammation. If the bacilli coli communis are combined with the streptococci, the inflammation in much more severe. Catarrhal lessions, or continued pressure, or any erosion in the appendix, would allow the escape into the adenoid tissue.

How do we divide lesions of the appendix?

(a) Endoappendicitis, an inflammation inside the appendix. (b) Parietal appendicitis, an inflammation in the wall of the appendix. (c) Periappendicitis, an inflammation around the appendix.

Give the varieties of endoappendicitis.

(a) Exudative, or catarrhal mucous variety.
(b) Suppurative, usually a variety of the catarrhal.
(c) Ulcerative.

Give a description of exudative endoappendicitis.

Mucus is thrown out and fills the appendix, causing a retention cyst.

What is appendicis obliterans?

Inflammation of the mucous membrane of the appendix causing scar tissue, transforming the appendix into a cord (obliterating the cavity).

Describe the suppurative variety.

It is due to the escape of the bacillus, which causes a multiple abscess.

Describe parietal appendicitis.

The mucous membrane being killed in spots, the bacilli enter the submucosa, causing a parietal inflammation. This goes on to the muscular layer, involving the arteries, and finally causing an obliteration of the appendix.

How does the infection of appendicitis spread?

By continuity and contiguity.

What is gangrenous parietal appendicitis?

It may be a gangrenous inflammation, in spots, of the entire appendix. The end artery being blocked up gives a triangular necrosis (showing that it is due to an infarct).

Describe periappendicular lesions.

A retrocaecal phlegmon is formed, which may spread and form a psoas abscess.

What kind of peritonitis may result from appendicitis?

(a) Purulent or septic. (b) Fibrino-plastic. (c) Fibrino purulent.

What are the three ways in which fibrino-purulent peritonitis may occur as the result of appendicitis?

(a) The pus, shut off by peritoneum, slowly works its way toward the surface of the abdomen.
(b) Progressive abscesses form.
(c) Perforation followed by an attempt of the peritoneum to wall off the pus.

What are progressive abscesses of peritonitis resulting from appendicitis?

One abscess is formed after another, always walled off by fibrinoplastic peritonitis. They may be found between the different loops of intestine through the abdomen.

What are the routes that an appendicular abscess may take?

(a) If inside the colon they may go down across the bladder along the descending colon to the spleen, or (b) they may go up along the

ascending and transverse colon to the spleen. (c) If outside the colon, they go up along the ascending colon to the liver, where they form subphrenic abscesses or rupture into the pleural cavity.

What is a diffuse purulent peritonitis?

The peritonitis develops very slowly as there is an attempt to wall off by the fibrinous adhesions.

How does the infection escape?

By means of alterations in the walls of the appendix and by perforation.

Give the prognosis of appendicitis?

It depends upon, (a) the varieties of bacilli present, the streptococci and bacilli coli communis being the more dangerous. (b) Location of the perforation; if it is near the caecum it is grave. (c) Direction of the appendix.

Give the directions of the appendix with its relative dangers.

The most dangerous is directly inward. Next, inward and upward. Next, downward and upward, and the least dangerous is pointing toward the liver.

Describe an ordinary attack of appendicitis?

The attack comes on suddenly and is supposed to be due to an error in diet, debauch, supper, etc. In the female, it may occur with the oncoming menstrual period. Cold may be given as a cause. Over-exertion may cause a number of bends and kinks to which the appendix is liable. Pain, bellyache with vomiting, disorder of the stomach, and slight rise in temperature, and usually constipation.

Why and how do you make a physical examination of the abdomen?

Because the slight bellyache may be the only subjective symptom of appendicitis. The patient is put on his back in a comfortable position and the abdomen is relaxed. Examine the two recti muscles and then examine for tenderness.

What points should you most carefully examine?

(a) Examine McBurney's point upon the left side. (b) Region of the gall bladder, and, last of all, McBurney's point of the right side, so the patient's attention is distracted from that place.

What are the three most important symptoms of appendicitis?

Pain, tenderness and rigidity.

Describe the characteristic pain of appendicitis.

First, in the epigastrium, then diffused, and later localized at McBurney's point. The severity of the pain depends largely upon the neurotic condition of the patient.

Describe the characteristic tenderness of appendicitis?

This is the pathogmomonic symptom. It is located at the McBurney point, and follows the line of the appendix. We can obtain it best by point pressure.

What is the characteristic involuntary rigidity of appenditis?

Board-like rigidity usually due to an abscess; then, slight rigidity, felt at insertions of the recti; and, finally, we may have the sunken, hard belly of peritonitis.

What is the characteristic appearance of the face in appendicitis?

Expression of pain, the hippocratic countenance developing as soon as peritonitis has set in.

What is the characteristic tongue in appendicitis?
Coated, and flabby, showing the imprints of the teeth.

What is the characteristic vomiting of appendicitis?
First, it seems like that of indigestion; later, it is simply a bubbling over.

What is the characteristic distention of appendicitis?
It is due to local arrest of peristalsis. A gaseous tumor results from the distention of the caecum and colon.

Describe the constipation in appendicitis?
It is reflex, and is often preceded by or terminates in an irritating diarrhoea.

What does the drawing up of the right limb indicate?
The irritation of the psoas and iliac muscles.

What importance has the temperature in appendicitis?
It is unreliable. Compare it with the pulse, as this is the only way anything valuable can be obtained from the thermometer.

To what is frequent urination and retraction of the testicles, occurring during appendicitis, due?
It is due to the irritation of the bladder and cremaster muscle, caused by the inflamed appendix.

Mention the different varieties of appendicitis.
1. Acute. (a) Rapid onset and gradual disappearance. (b) Fulminating. Usually ending in death before anything can be done for the patient.

2. Chronic. (a) Appendicitis obliterans. A knowledge of this variety is of little value as it is only found on the post mortem table. Recurring—In which we have two or more attacks, but with no tenderness between the attacks. Relapsing—Patient has had several attacks, but here the tenderness is present between the attacks.

What are the varieties of appendicitis?
Acute, hyperacute or fulminating, subacute and chronic.
Acute is sudden in onset and gradual in disappearance.
The fulminating variety usually ends in death before anything can be done for the patient.
Subacute: Onset not so sudden, pain moderate, rigidity slight.
Chronic: May be recurring—several attacks without tenderness between the intervals; or relapsing, in which tenderness is constant.

What are the indications for operation?
Acute cases should be operated immediately. Subacute and chronic cases can be operated between the attacks. A case usually runs 12-48 hours, when it either gets well or must be operated. If it runs over twenty-four hours, operate. If it runs over twenty-four hours, becomes well and again gets worse, operate. If it runs over the time and stops to get well, then operate.

What are some of the questions as to an operation between attacks?
If an attack has once recurred, it had better be operated. Relapsing appendicitis should always be operated. If patient lives at a distance from surgical aid, suggest operation after first attack.

What is the treatment of an attack of appendicitis?
Do not give purges early, as they tend to liquify the faeces and stimulate the already excited peristalsis of the appendix. Unload the

large bowel with enemata. It is a surgical disease and should always be relieved by the removal of the appendix.

Remedies: Belladonna (when there is localized tenderness), cuprum arsenicosum (for the pain): nux vomica and pulsatilla (for the general symptoms); sulphur. Never give opium, as it binds up the whole bowel and masks the whole condition.

What other conditions make the diagnosis of appendicitis difficult?

Renal Colic—Examine the urine and you may find haematuria and albumin. There will be pain running along the ureters.

Typhoid Fever—Here we have the characteristic temperature curve and later the eruption.

Twisted Ovarian Tubes—Insist on pelvic examination, which will help you to differentiate.

How can appendectomies be divided?

I. (a) Removal during the attack. (b) Removal between attacks.

II. (a) With pus. (b) Without pus.

What are the preparations necessary for an appendectomy?

Give rectal injections to unload the bowels. Purgatives and anodynes should never be used. Shave the entire iliac and umbilical region. Scrub carefully (to prevent rupture if an abscess has already formed) and apply a bichloride towel.

What instruments are necessary for the operation?

One scalpel, one pair of scissors, six artery clips, two retractors, two tissue forceps, one groove director, silk, cat gut, silk-worm gut and needles, gauze, iodoform gauze and aristol.

What incision is usually made for appendectomy?

One extending at right angles to a line drawn from the anterior superior spine of the ilium to the umbilicus, going through McBurney's point. The incision is usually three to four inches in length.

What incision is made to preserve the integrity of the abdominal walls?

The gridiron or criss-cross incision.

After incising the peritoneum what is the next guide to finding the appendix?

The bands of the ascending colon, or the junction of the ileum and caecum.

Describe further the procedure for the removal of the appendix.

If a pus-containing cavity is expected, pack the abdominal wall around the appendix before attacking the latter; then tie off the mesoappendix in section, and ligate the appendix and remove it.

What care must be taken for the exposed intestines?

They must be covered with hot towels to prevent shock and paralysis.

Why is it so important to ligate even the smallest vessel of the mesentery?

The arteries are lying in the loose areolar tissue and as there are no muscular fibers to contract upon them after injury, dangerous hemorrhage may result from a very small vessel.

What material is used to suture the stump?

Black silk. If the stitches go through the mucous membrane, catgut may be used. The latter will swell up and entirely close the opening made by the needle.

How do you close the abdominal wall?

We may use silk-worm gut and carry the stitches from within out, through the entire thickness of the abdominal wall. In the criss-cross incision, the peritoneum is closed by silk. Silver wire may be used for the transversalis and internal oblique. The rest may be closed by silk, etc.

HERNIA.

What is a hernia?

It is a protrusion of one of the organs of the body from a cavity in which it originally belonged. It is ordinarily known as a rupture.

What is a protrusion or a prolapsus?

Here the contents of a cavity come out through a wound.

Give a division of herniae according to the manner of their formation?

(a) Congenital, (b) Acquired, (c) Traumatic.

What is the cause of a congenital hernia?

It may be due to an arrest of development, as the non-closure of the tunica vaginalis, or umbilical opening. As a rule we find in such cases numerous other errors of development, as hare-lip, cleft palate, club foot, etc.

What is an acquired hernia?

It is a hernia taking place at naturally weak points as the inguinal or femoral rings, the umbilicus, Petit's triangle, or the diaphragm.

What is a traumatic hernia?

One produced by an injury or an operation, usually known as a ventral hernia.

Divide herniae according to the location of the opening.

Inguinal, umbilical, femoral, sciatic, lumbar, diaphragmatic and obturator.

Of how many parts does a hernia consist?

Three. The sac; the contents of the sac; the coverings of the sac.

What changes may take place in a hernial sac when protruded for a long time?

It may undergo changes through pressure and infusion, and a thickening like calcareous plates may occur. At times we have tubercular changes in the sac. In some cases these changes help to cure the hernia. We may also have serous inflammation, producing adhesions, and below these adhesions fluid accumulations, resembling a hydrocele. Or, we may have fatty accumulation over the hernia, closely resembling a fatty tumor, and known by the French as Lipome Herniaire (Hernial lipoma.) These hydroceles and hernial lipomas are most frequently seen at the femoral opening.

Name the herniae which have a partial sac only.

Sigmoidoceles and caecoceles.

What are the coverings of the sac?

There are seven distinct anatomical layers. From a surgical standpoint they are of little value, as they cannot be distinguished during an operation.

What forms the contents of the hernial sac?

Most frequently the omentum; next the small intestine, especially

the ileum and jejunum; then the large intestines. Every abdominal viscus (except the pancreas and rectum) has been found as the contents of a hernial sac. After they have been in the sac for a long time they undergo secondary changes. The omentum becomes thickened and adherent; the intestines adhere and show plastic inflammations. When the intestine has been out very often, its mesenterry is usually found elongated.

Classify herniae according to their contents.

Enterocele (intestine.) Epiplocele (omentum.) Entero-epiplocele (intestine and omentum.) Gastrocele (stomach.) Caecocele (caecum.) Cystocele (bladder.) Sigmoidocele (sigmoid.)

What is a Littre's hernia?

It is a partial enterocele and occurs most frequently at the femoral ring and as obturator hernia. Some text-books describe it as hernia of Meckel's diverticulum. It is, however, a pinching of a part of the intestine.

What are the causes of hernia?

They are predisposing and exciting.

Give some of the predisposing causes.

Heredity has a certain influence, especially if mother suffered from hernia.

Age—Most herniae occur before the age of fifty. Forty per cent. occur before thirty-five years of age, most of the sixty per cent. occur between 45-50; showing that they occur in the straining age. Hernia is frequently found in hard working men and women; in women especially at the child-bearing age. Very few occur in women after the climaxis. Anything relaxing and weakening the abdominal wall will predispose to hernia, therefore we find it often in pot-belled men, or in atrophy of the abdominal wall. Also in ascites.

Give some of the exciting causes of hernia?

Some kind of a strain, constipation, cough, especially the sudden attacks. Sudden muscular efforts in certain positions.

What are the conditions of herniae; or give their clinical division?

Reducible, irreducible, incarcerated, inflamed and strangulated.

Give description of a reducible hernia.

It is at first noticed as a fullness; later on, as a soft mishapen tumor which becomes very prominent. Coughing gives an impulse to the examining finger. On lying down the fullness disappears. In connection with the tumor there is a dragging. These herinae appear gradually, very seldom suddenly.

How can you differentiate whether such a hernia contains intestine or omentum?

If it contains intestine, we have a tympanitic percussion note; the cough impulse is all over the tumor, which is elastic; and, on returning it into the cavity, we have a gurgling sound. If omentum is contained, we have a more doughy feeling; a flat percussion note; and the impulse only on one part of the tumor, and no gurgling on returning it.

Is a person with a hernia eligible to the army, navy, fire department or life insurance, etc.?

He is not, unless it can be proven at the time of his entrance, that the hernia is small and can be very easily reduced, no adhesions having formed.

What is the treatment for hernia?

Palliative treatment or the so-called radicle cure.

What do we understand by palliative treatment of hernia?

It consists in adjusting a truss or a bandage which retains the hernia and gives the patient perfect comfort. Such a truss may cure the hernia, especially if in a child. Should the child be too young to wear a truss, let the mother rub the inguinal ring several times a day, while the child is lying on its back. This will tend to produce a plastic peritonitis and cause a cure. To obtain a cure in this way it usually takes two years. The injection treatment is used on the same grounds, the object being to bring about a plastic peritonitis.

What is an irreducible hernia, and at what age is it usually found?

It is a hernia which cannot be returned into the abdominal cavity. Usually found in old people, especially women. When found in the young it is likely to contain the caecum or the sigmoid flexure.

Why can we not reduce these herniae?

Because the omentum pushes out, and by pressure produces atrophy, which is followed by overgrowth of the protruded portion. Inflammation from rough taxis and adhesions of the omentum may cause the irreducibility.

What are the consequences of an irreducible hernia?

Inflammations, faecal obstruction and strangulation are apt to take place.

How would you treat an irreducible hernia?

Try to prevent obstructions and adhesions by giving a very simple diet. Patient's work must be light. Keep the bowels open and use a concave pad to support and protect the hernia, also to keep more from coming out. It may be necessary for the patient to wear a bag. In recent cases you may try taxis with rest in bed and elevation of the pelvis. Cold applications to the hernia cause it to contract. Sometimes heat will do this. Operation is indicated sooner than in the reducible hernia?

What is an obstructed or incarcerated hernia?

It is a hernia in which the faecal current is interrupted, but the circulation is not cut off. It is apt to occur in irreducible, large umbilical and scrotal herniae.

Give the symptoms of incarcerated hernia.

Griping colicky pain, swelling of the tumor, constipation. Local pain is not marked and local tenderness is absent. Dragging sensation. If you get cough impulse or can introduce your finger along side of the protrusion, you know at once that it is not strangulated.

What is the treatment for obstructed herniae?

Persistent vomiting indicates immediate operation. You can use general massage to push out the faeces, or an enema to start the bowels. Then give a saline purge. Place in supine position, elevate the hips and use ice bag.

Nux vomica given at the beginning is of great value.

What is an inflamed hernia and what is the result?

It is an irreducible hernia which becomes inflamed as the result of taxis or badly fitting truss. It results in two conditions, viz. (a) Localized peritonitis with exudation of plastic matter (the exudate may be encysted). (b) Phlegmonous condition of sac and parts surrounding.

What are the symptoms of an inflamed hernia?

Heat, swelling, tenderness, pain, localized peritonitis, or a localized phlegmon.

Describe the treatment for inflamed hernia.

That of inflammation anywhere. Rest, ice bag, belladonna, hepar. As soon as obstruction is noticed, operate.

What is a strangulated hernia?

It is a hernia in which both the faecal current and circulation are cut off. It is irreducible. This, at times, takes place in a reducible hernia.

What is the old theory as to the production of a strangulated hernia?

It was thought that it was due to faeces, but this is not true, as the small intestines are most frequently involved, which do not contain faeces.

What are the causes of strangulated herniae?

Reducible hernia:—Exertion, cough, stools, etc.

Irreducible hernia:—Inflammation or engorgement of the contents, adhesions, omental bands and twisting of the intestinal loop. There is rarely strangulation on production of a hernia.

What is the pathology of a strangulated hernia?

The elasticity of the rings permit forcing out of gut during expulsive efforts, as at stool. Then the ring pinches down, causing moist gangrene because the veins are cut off, but the arteries not. The intestines change in color to red, blue, mahogany and black. There is an inflammation with exudate, which is serous, then fibrinous, then putrid and sticky.

What is nature's cure for strangulated hernia?

It is a sloughing off of the obstructed intestine, or the formation of a putrid abscess. Quite frequently a general peritonitis results when left to nature.

Give the symptoms of a strangulated hernia.

Those of obstruction. Presence of a tumor somewhere, which is tense, painful, tender and irreducible. There is no cough impulse. There is usually localized pain or it may be epigastric. The vomiting is that of obstruction, projectile. The distention is also that of obstruction. Constipation. We may have symptoms of abscess or peritonitis, or symptoms of collapse. In omental strangulated hernia, symptoms less marked. May be some bowel movements. The guides are the local symptoms. Littre's hernia is more severe. Diagnosis is easy except in fat people. It is obscure in partial hernia or epiplocele.

What is the prognosis of strangulated hernia?

Patient usually lives one week. Recovery is usually impossible. There is great danger in delay. The older the patient, and the longer the hernia is strangulated, the graver the prognosis. The occurrence of gangrene depends on the amount of pinching the gut receives. It may come on in four hours or not for weeks.

Describe the methods of reduction of strangulated hernia.

Put patient to bed with hips elevated. Apply cold to tumor. Flex the limbs or even invert to relax the tissues. Steady the ring and push back the gas for from three to five minutes. After two attempts, you must operate. You know that you have been successful if you hear a gurgle and the pain ceases, or vomiting is arrested, or a bowel movement occurs soon afterward.

What is the after treatment?

Keep the patient on his back with a light pad to the ring and on light diet and give the remedies appropriate to inflammatory troubles.

What are the dangers of taxis?

(a) Rupture, (b) Contusion, (c) Peritonitis from fluid pressed out, (d) Only partial reduction, (e) Rupture of the sac, (f) Reduction en bloc.

What is reduction en bloc?

The sac and its contents are replaced in a mass, giving the appearance of a reduced hernia, while the obstruction persists.

What is the operation for strangulated hernia?

It is a herniotomy or kelotomy. It is even justifiable when the patient is almost dead; but the earlier it is done the better. It consists in opening the sac, noting its contents and their condition, then relieving the obstruction by making an open incision, and dividing it. Return the contents if they are all right and sewn up, after bleeding is carefully stopped.

What are the signs of vitality of the pinched intestine?

If the intestine glisten and is firm and elastic, it may be returned. Its color may be red, purple or mahogany. Fluid is clear, bloody and odorless. If it is lustreless, black, flabby and oedematous and remains cold and there is a putrid or sero-purulent fluid, condition is serious.

How do we treat devitalized intestine?

Apply hot towels, or replace it in the peritoneal cavity; but place a string around the coil or you may lose it. If this does not revive them, one of three things may be done:—Either leave them out well packed in an anti-septic towel; or resect the portion and leave the two ends sticking out, forming an artificial anus; or resect and unite the ends. For this latter a large opening is necessary.

How would you treat omentum?

If it is small and looks normal, you may put it back. If it is gangrenous, tie it off in sections; but be sure, however, to tie tightly.

Describe an inguinal hernia and give the varieties.

It is a hernia emerging through the inguinal canal. The varieties are Direct (84 per cent) and Indirect (90 per cent).

Which variety is more common?

The indirect or oblique.

Differentiate between direct and indirect inguinal herniae.

An indirect starts at the internal abdominal ring, comes downward and forward to the external ring, and from there may go on to the scrotum. The epigastric artery lies internal to it. The direct is never congenital and always occurs in adults. It forces through the abdominal ring, comes forward and a little outward. Epigastric artery is external to it.

How do we divide oblique inguinal herniae?

Into the congenital and the acquired varieties

Describe the descent of the testicles.

They descend from their foetal position near the kidneys, guided by the gubernaculum testis into the scrotum, through the inguinal canal, bringing with them a process of peritoneum, which closes above and below, leaving the vaginal portion below, and the funicular portion above.

What is an infantile hernia?

It is an acquired hernia of children and is classified with the congenital. It occurs when the septum forms at the ring, but no closure occurs below. The hernia carries along its own peritoneum, so that it is necessary to cut through three layers of peritoneum when operating.

What age and sex are predisposed to acquired inguinal hernia?

Adult males who have laborious work and a weak abdominal wall. Therefore, they are often found in very stout men.

Describe the onset of an acquired inguinal hernia.

The development is usually slow. There is little bulging in the standing posture. Cough impulse is present

Mention the layers of an inguinal hernia.

Skin, superficial fascia, intercolumnar fascia, cremasteric fascia, infundibular fascia, peritoneum.

How can you diagnose a direct inguinal hernia?

The epigastric artery is always outside. The direct herniae are more spherical and rarely get into the scrotum. The indirect are oval and descend into the scrotum.

Explain the manner of descent of a direct inguinal hernia.

It forces its way through the abdominal wall (conjoined tendon and triangular ligament) on a level with the external ring. Then it passes forward, outward and downward to the inner side of the epigastric artery, the cord being anterior and external. It usually occurs in adult males, but never in children and is, therefore, acquired. It is really a ventral hernia and is spherical and not oblong, and is rarely scrotal.

How can we divide inguinal herniae as to the extent of the protrusion?

Into the complete and the incomplete varieties.

What are the symptoms of a direct inguinal hernia?

Pain, not acute, but annoying. On this account you must examine for hernia. We also have a cough impulse and a lump, which is larger on standing.

What is the difference between complete and incomplete hernia?

The incomplete hernia is in the canal or just appearing at the external ring and is called a bubonocele. In the canal it appears as a lump with cough impulse. A complete hernia is simply a tumor in the scrotum. It may be reducible, irreducible, incarcerated, or strangulated.

Describe the mechanical treatment for inguinal hernia.

Use trusses. This is mostly palliative, except in the young. Twenty per cent. of children are cured. Its efficiency lies in its power to keep the hernia from protruding.

What are the chief points necessary in a good truss?

It must be comfortable and press just enough. The truss should press at the internal abdominal ring. If it press too hard it may cause atrophy.

What would you do in inguinal hernia in very young children?

Endeavor to get a plastic inflammation. Keep them on their back and try to prevent them from crying. The mother must give daily massage. It may be necessary to have a suspensory or a protection plate.

Describe the principal operative treatment for inguinal hernia.

The best operation to-day is the operation of Bassini. The sac is opened, the contents are replaced, and then the canal is split up; the cord is held up, and the transversalis and internal oblique are united, forming the floor of the new canal. The cord is then placed upon it, and the aponeurosis of the external oblique and the skin are sewed over the cord.

What is the Czerney-Riesel or Bank's operation?

It consists in pushing up the mass and uniting the pillars of the external ring. Here, however, many relapses follow (fifty per cent.).

Give a few modifications of the above operation.

The Ball operation is simply the twisting of the sac. The Macewen method is a folding of the sac, which is sewed and put into the internal ring as a buttress. He sews the conjoined tendon to Poupart's ligament, which is a decided advantage.

Describe the method of Kocher.

Make an incision over the hernial tumor, down through the skin and superficial fascia, exposing the aponeurosis of the external oblique. Then make an incision of about 1 inch directly outside to the internal ring through all the muscles down to the sack. In this last opening introduce a pair of artery forceps and pull the previously-emptied sac up. Introduce a suture through the abdominal wall which obliterates the opening into the sac, and another one to close the inguinal canal. Then lay the empty and slightly twisted sac upon the aponeurosis of the external oblique muscle and bury it by folding and sewing the sheath over it from either side. Then the skin is sutured in the ordinary way. This operation can only be used in easily reducible and small herniae.

What is the operation of Halstead?

This is a modification of Bassini's. He cuts out all the spermatic veins to make the opening smaller; then he sutures up all the muscles and lays the cord on the aponeurosis of the external oblique. There is nothing but skin and superficial fascia outside the cord.

Describe the McBurney operation.

He ties off the sac and allows the wound to heal from the bottom by granulation. He argued that granulation tissue would contract. But as the scar tissue gets older it gives way to pressure, and the herniae recur.

Describe the operation of Lucas Championere.

It is practically Bassini's operation until the cord is raised, then it differs, in that Bassini simply unites the muscles which form the floor of the new canal, while Championere overlaps the muscles.

What are properitoneal and interstitial herniae?

The properitoneal hernia is one which goes up and down just outside the peritoneum. When it burrows between two layers of muscles we call it interstitial.

What are the causes of a properitoneal hernia?

It often follows the application of a truss to the external ring instead of to the internal ring. Ectopic testicle.

What are the varieties of properitoneal herniae?

1. Herniae between the peritoneum and the transversalis fascia.
2. Herniae between the internal and external oblique muscles.
3. Herniae outside the aponeurosis of the external oblique.

The last two varieties may be scrotal.

What are the causes of properitoneal herniae?

They are usually mechanical. The hernia cannot descend because of hydrocele or an ectopic testicle, or because of a truss having been applied to the external ring rather than to the internal, it enlarges into the muscle.

What is the diagnostic symptom of a properitoneal hernia?

Suspect it whenever you are able to reduce the hernia but partially, a bulging at the opening remaining.

Describe the treatment for a properitoneal hernia.

It is that of any other hernia. If due to an ectopic testicle, draw the testicle down. If due to a hydrocele, remove that.

How often is the caecum or the sigmoid flexure contained in an inguinal hernia?

The caecum is found in 5 per cent. of inguinal herniae and nine out of ten herniae contain the sigmoid flexure.

How many varieties of caecoceles are there?

Two, acquired and congenital.

If the appendix be found in a hernia what practical point should be remembered?

You must not tie off the sac, for by so doing you cause bowel obstruction. Divide the sac below the caecum, sew the caecum and transplant the stump.

What are the varieties of herniae of the bladder?

Two, the extra- and the intra-peritoneal.

Differentiate between the two.

In the extra-peritoneal the bladder slips under the peritoneum and the hernia has no sac, but the sac is the bladder and may be opened into when not recognized. In the intra-peritoneal the bladder comes down with the intestine into the sac and is not so likely to be opened.

How can you recognize hernia of the bladder before you operate?

It is not an easy matter, but suspect it when you have a hernia direct in character, very painful and not benefitted, but aggravated by a truss; also when there is dysuria, insufficiency of bladder, tenesmus.

What is an inguino-perineal hernia?

It is a mass in the perineum which gives the cough impulse, and is related to the abdominal ring. We find the testicle absent on that side. and when the tumor is pinched the characteristic sick feeling is produced. It is due to an ectopic testicle. It is very rare.

Define a femoral hernia.

It is pre-eminently a hernia of women, which exists by way of the femoral canal, entering it at Gimbernat's ligament, and coming out at the saphenous opening.

Name the coverings of a femoral hernia.

Skin, superficial fascia, cribriform fascia, femoral sheath, septum crurale, pre-peritoneal fat, peritoneum.

Give some characteristics pertaining to a femoral hernia.

They are apt to contain omentum and to come out during labor. Adhesions are common, and hence they become irritated.

Give the symptoms of a femoral hernia?

Dull aching pain, dragging; exertion causes a tumor in the groin outside the pubic spine and below Poupart's ligament. The femoral vessels are outside the hernia. As a rule, they grow slowly and do not become particularly large.

What course does a femoral hernia take?

First they come downward and forward. At the ring they curve directly forward, and then curl upward and outward on account of the falciform fascia. Reduction is therefore in the reverse order, i. e., downward and inward, backward and upward and backward.

What prognosis can you give in a femoral hernia?

It is readily and easily controlled by a truss, but never cured.

How would you treat a femoral hernia?

Apply a truss in one that is reducible, and a hollow pad in one that is irreducible. Use a bag in the enormous ones and a pad plus elastic pressure when there is an epiplocele; but better than this is repeated taxis with cold and position.

What suggestion would you make as to an operation?

In a woman under forty, unless contraindicated, encourage operation, especially when the hernia is irreducible.

What is Kocker's method for operation in femoral hernia?

Tie the sac up as high as possible, and attach the falciform to the femoral fascia.

What is Bassini's operation for femoral hernia?

This is the closure of the defect in the femoral canal at its beginning by introducing three sutures to unite Poupart's ligament to the pubic fascia, and transplanting the sac to some other part of the thigh by reduction and high ligature of the sac. The first suture is at Gimbernat's ligament, and the last one as near as possible to the femoral vein. Unite the falciform border to the pectineal portion of the fascia lata over the septum and then suture the skin.

How does the incision differ when the femoral hernia is strangulated?

In that it must be made more carefully because the obturator artery is sometimes given off from the epigastric. The object of the incision is to simply nick the constriction.

What are the operative results in femoral hernia?

Relapses are less common than in inguinal hernia, therefore the results are better.

What is a ventral hernia?

A hernia occurring at any part of the abdominal wall weakened through a scar or through the separation of muscles.

How many varieties of ventral herniae are there?

Two, congenital and acquired. The congenital are due to defects in the aponeurosis; they are usually found at the linea alba at birth. The acquired or traumatic usually follow scars from laparotomies, accidents, blows, or the separation of muscles such as occur in frequent pregnancies.

What peculiarities about ventral herniae should be kept in mind?

There is no definite opening or ring to sew up and no distinct sac. The intestine may be adherent; hence, always cut to either side of the cicatrix.

What is the prognosis of ventral herniae?

If left alone, they become enormous. They give inconvenience. Otherwise they are not dangerous. As a rule there is no obstruction or strangulation.

Describe the treatment for ventral herniae.

The preventive treatment is of great importance. It is accomplished by getting primary union of the wound and by wearing a flat pad for support.

The palliative treatment is practically the same as the preventive.

The operative treatment is not particularly dangerous, excepting where adhesions occur; but the results are not very satisfactory. The patient must wear a pad.

How many varieties of umbilical herniae are there?

Three—congenital, infantile and acquired or adult.

What is a congenital umbilical hernia?

It is a hernia due to the imperfect closure of the omphalo-mesenteric duct. The contents are usually intestine, but may be made up of any of the abdominal viscera. There is no sac, but the viscera may be covered by myxomatous tissues of the cord and its amniotic layer, continuous with the skin. It usually requires operation a few hours after birth. Better results are obtained by the application of a pad and an operation later.

What is an infantile umbilical hernia?

It usually occurs at the fourth or sixth month of life, and is due to the stretching of the fibrous tissue of the umbilicus through coughing, straining, crying, constipation, etc. As a rule, they remain quite small and are not dangerous. Carefully adjusted trusses will cure the majority of these herniae. Strangulation never occurs in this variety.

Describe the acquired umbilical herniae.

These occur in adults, usually through the umbilicus. They are rarely para-umbilical, i. e., ventral. They usually occur through the upper portion of the ring along the remnants of the weaker umbilical vein. The coverings are the skin, subcutaneous tissue and the peritoneum, which is often very thin. The contents usually consist of omentum, colon or small intestine. Adhesions are common. The causes are ascites, pregnancy and excessive development of adipose tissue, etc.

What are the symptoms of acquired umbilical hernia?

The same as those of inguinal hernia, but digestive disturbances are common. There is dragging pain, worse on exertion; obstruction and local inflammation in the irreducible variety.

Describe the methods of treatment of umbilical herniae.

Spontaneous cure is unknown and the irreducible variety constantly enlarge. Palliation is employed to prevent enlargement and the formation of adhesions and an abdominal belt or truss is used. In the irreducible form careful dict, etc., must be prescribed. If the truss causes inflammation and ulceration, a hollow pad should be used in its place. The operative treatment is safe, especially in the reducible form, but relapses are more frequent than in inguinal or femoral herniae. An elliptical excision of the umbilicus is made through the skin to the sac; then the wound is sewed up layer by layer. Operation is rarely indicated in the irreducible form, excepting when strangulated. Such subjects are bad to treat. They have a fat, flabby or atrophied belly. Omental adhesions and relapses are frequent.

What is a lumbar hernia?

This is a hernia coming out at Petit's triangle, which is the weak spot in the loin. Petit's triangle is formed by the external oblique, the latissimus dorsi and crest of the ilium.

How would you treat a lumbar hernia?

They are always controlled by a truss or belt.

What is an obturator hernia?

It is a protrusion of an abdominal viscus forward, downward and inward through the obturator foramen. It is more common and more dangerous than the lumbar hernia, and is mostly found in old women with flabby tissues.

Give the symptoms of obturator hernia?

They are those of strangulation. You will recognize a mass in the inner lower thigh, inside the vessels. The mass will be found in rectum or vagina with the finger. The pain is reflected to the hip joint. This is due to pressure upon the nerve and may arouse suspicion of hip joint disease.

What is the treatment for obturator herniae?

They have been operated by cutting inside the vessels or by coeliotomy, but mostly by abdominal section because not recognized, though they are sometimes operated that way even when recognized. Mortality is high.

What is a diaphragmatic hernia?

A protrusion of almost all the abdominal viscera through the normal openings or ruptures of the diaphragm.

How many varieties of diaphragmatic herniae are there?

Two, congenital and acquired. The acquired hernia is usually found in adults and is due to severe injury. Diagnosis is difficult, prognosis very grave. The congenital variety is usually from defects. Death is usually quick from interference with the heart and lungs.

Describe a retro-peritoneal hernia.

This is one of the varieties of bowel obstruction. It is the mesenteric hernia of Cooper. It consists in a hernia going through some opening into the posterior peritoneum. It may pass through the foramen of Winslow, the fossa duodeno-jejunalis, or the superior and inferior ilio-caecal fossae.

Describe and give diagnosis, symptoms and treatment of pelvic herniae.

They are one-sided and usually occur in adult women, being found in the ischio-rectal space, vagina or the posterior portion of the labium majus.

Diagnosis:—Vaginal hernia may simulate abscess, prolapsus, recto-cele, cystocele, a cyst or a polypus.

The symptoms are usually numbness of the leg, difficulty in walking and dysuria.

Treatment:—They are usually reducible. They may be supported by a pessary or a perineal band. They are rarely strangulated.

What can be said of rectal herniae?

They are very rare. When outside the sphincters they simulate prolapsus; when inside, intussusception.

What is an ischiatic or sacro-sciatic hernia?

It is a hernia through the sacro-sciatic foramen. It goes under the giuteus muscle down the thigh and has a cough impulse; or, oftener, it goes over the trochanter major and disappears on the anterior surface of the thigh. It contains omentum, intestines, ovary and sometimes the bladder. Treatment:—Incise over sac or perform a laparotomy.

Where should a truss for an inguinal hernia be applied?

It must be applied above the bone and should cover the internal ring.

Why are hard rubber trusses to be preferred?

They are non-irritating, shell like and always cool.

What facts should be stated when ordering a truss?

Length of time the case has been ruptured.
If on one side only, state whether right or left.
If on both sides, state which is worse.
If inguinal, whether direct, indirect or scrotal.
Tell if reducible. If not, state how long since.

Give the circumference of the abdomen (taken with tape rather tight) a few inches below the spines, on a line with the rupture.

State whether the form is round or flat, age, sex, occupation, weight, height.

SURGERY OF RECTUM.

Describe the rectum.

It is the lowest part of the alimentary canal, being about eight inches in length and extending from the third sacral vertebra to the anus. Its upper portion only is covered with peritoneum, the lower half inch or inch being entirely free from it. The blood vessels and nerves are contained in the meso-rectum. The rectum contains two sphincters. One is in the anus and the second or internal sphincter is a little higher up. Normally, we have a number of pouches in the rectum and papillae giving sensation to the parts. The upper part is directed downward and backward; the middle portion downward and forward; the lower part downward and backward.

With what structures is the rectum in relation?

Behind with the sacrum and coccyx. In front with the vesiculae seminales, the prostate gland, the bulb and the membranous portion of the urethra in the male; and with the uterus, ovaries, vagina and perineum in the female. All these parts can be well explored through the rectum.

Describe the development of the rectum?

In early foetal life the genito-urinary tract and lower portion of the alimentary tract are one pouch, the urachus. The anus comes up one or one-half inch to meet the rectum, and is formed from the epiblast, the rectum being formed from the hypoblast. The rectum brings down its own vessels, the superior haemorrhoidal branch belonging to the portal circulation. The anal vessels belong to the systemic circulation.

What is an imperforate anus?

It is a condition in which the anus has not ascended sufficiently high to meet the rectum.

What is an imperforate rectum?

A condition in which the rectum has not descended far enough to meet the anus.

What is the treatment for imperforate anus and rectum?

If the anus is at fault, simply cut through with a bistoury. For imperforate rectum it becomes at times necessary to make an artificial anus.

What is pruritus ani?

It is a persistent and annoying itching sensation, caused by thread worm and found especially in children. Sometimes it is due to eczema. which is, however, mostly the result of an ulcer in the rectum.

How would you treat pruritus ani?

By the application of cold or heat; or the application of tar preparations. Obstinate cases require dilatation of the sphincters.

In what kind of patients would you expect to find foreign bodies in the rectum?

In the insane or in children. They are either introduced directly through the anus, or come down from above as pieces of bone from the food.

What are some of the predisposing causes in the production of haemorrhoids?

The erect posture of man, and the fact that the haemorhoidal veins have no valves. A person may be hereditarily predisposed.

Mention some of the exciting causes of haemorrhoids.

Anything producing a direct pressure, as constipation, enlarged prostate, etc.

How are haemorrhoids divided?

Into external and internal. The external may be venous or simple skin tabs, which have previously been haemorrhoids.

Describe the treatment for skin tabs.

They may be excised. Paint with cocaine or eucaine. Do not cut inside of Hilton's white line.

How are the internal haemorrhoids divided?

Into the venous, columnar and nevoid varieties.

The venous piles are distentions of the endings of the superior mesenteric veins, and usually follow heart or liver trouble. The columnar form a column just inside the anus, and a nevoid is a capillary pile.

What are the chief symptoms of haemorrhoids?

Discharge of blood after the stool or covering the stool. Pain during defecation. Any kind of reflex symptoms.

What is an acute haemorrhoid?

It is simply an inflamed haemorrhoid, regardless of kind or variety.

What is the general treatment for haemorrhoids?

Cut down the heavy food and wine. Medicines are useful in the first stages only. As soon as the connective tissue has developed surgical treatment is the only relief. For painful haemorrhoids, apply hot or cold water, especially for the inflamed haemorrhoids. When protruding, it can be cleansed and returned. Cleanliness is very important.

For small venous tumors, dilatation and paralysis will relieve, provided the haemorrhoids are in the grasp of the sphincter.

What are the operative methods for haemorrhoids?

Injection method; ligation; clamp or cautery; Whitehead operation; American or Pratt method.

Describe the injection method.

It consists in the injection of iodoform, or the chloride of zinc, or carbolic acid 1—2 or 1—10 of water, or a mixture of: Fluid extract of ergot, one part; glycerine, one part; carbolic acid, one part; water, three parts.

What are the objections to this treatment?

It is not applicable to external haemorrhoids.

Only two or three haemorrhoids can be treated at one sitting.

The sittings must be one to three weeks apart to prevent inflammation.

It often produces inflammation, ulceration and even death.

Describe the ligation of haemorrhoids.

The pile is lifted up, its base cut, and a stout silk ligature thrown around the neck of the haemorrhoid and the latter is then snipped off.

What are the objections to this method?

It is a very unsurgical procedure. It produces sloughs, often shock, impinges nerves, and may give rise to secondary haemorrhage.

How should a patient be prepared for an operation for haemorrhoids?

Give a purge and a rectal enema through a tube, so as to empty the intestines entirely and to get rid of the mucus which is often contained in the rectum when haemorrhoids are present.

In what position is the patient placed on the operating table?
Lithotomy position.

What is Hilton's White Line?
The junction of the rectal mucous membrane and the skin.

What is Smith's operation for the removal of haemorrhoids?
It is the clamp and cautery operation. The haemorrhoid is grasped with the clamp and burned off with the cautery.

Describe Whitehead's operation.
Make an incision at Hilton's white line: then dissect the pile bearing mucous membrane out, and unite the mucous membrane from above with the skin.

Name some dangers of Whitehead's operation.
There will be severe haemorrhage. An unskilled man may dissect out part of the sphincter muscles. If the circular incision is made external to Hilton's white line the mucous membrane would cover the anus. (Here you would have to transform this mucous membrane into scar tissue by scarifying).

In what does the American or Pratt method differ from that of Whitehead?
Instead of first incising Hilton's white line and dissecting up, he incises up and dissects down.

Describe Marcy's operation for haemorrhoids.
This is the latest modification and probably the best. An incision is made around the pile at Hilton's white line, and the mucous membrane is dissected up; but not quite to the piles. Then the piles are lifted out of the bed, ligated with cat gut and cut off. The mucous membrane is then put back, in this way preserving its blood supply and doing away with scar tissue.

Give the symptoms of fissure of the anus.
Great pain after stool, which persists for hours. Dull heavy pain in the small of the back, which in women is reflected to the vagina or uterus, and is so severe that many women think they have a cancer. The stool at times is streaked with blood. As a rule it is located posteriorly.

What is the cause of fissured anus?
In adults it is often syphilitic; therefore, examine with care to prevent infection.

What is the treatment for fissure of the anus?
As the muscle, when contracting, constantly irritates the patient, it is better to cut straight through the fibres of the muscles at the fissure. In a short time the wound will heal and the powerful sphincter will be preserved. If the patient does not consent to such an operation, palliate with mercurial ointment.

What are the varieties of ischio-rectal abscesses, and give the causes of each?
Acute and chronic The acute is due to infective bacteria. These may find access through traumatism or an ill-fitting bicycle saddle, or by infection from the rectum.

Mention some symptoms of ischio-rectal abscesses.

Heaviness about the rectum, throbbing pain, pink tinge on the buttocks, and, lastly, fluctuation.

Give the treatment for ischio-rectal abscesses.

Early free incision and drainage. The length of the incision should equal the width of the abscess. Then use peroxide of hydrogen 1—3, unless the patient is anaesthetized, when it can be used pure. Pack lightly with gauze.

What results when such an abscess is not treated?

It breaks into the bowel, and the skin breaks down, forming a fistula. Ischio-rectal abscess is the second most common cause of fistula.

What is a marginal abscess?

It is an abscess of the margin of the anus between the two sphincters.

Give the cause of a marginal abscess.

Foreign material between the sphincters, causing ulceration. Periproctitis.

Give the treatment for marginal abscesses.

Use early incision to prevent fistula. If a blind external fistula, we should complete it and treat as a complete fistula.

What is the treatment for complete fistula?

The recognized method is to incise all the tissues between the tract and external sphincter. Do not put the finger into the rectum before the groove director is passed into the fistula, as the latter would be tortuous on account of the contraction of the sphincter over the finger. Paralyze the sphincter and use mild antiseptics, as the rectum is very susceptible to poisoning. Another method is the application of an elastic ligature, which will cut through the tissues between the fistula and rectum in about six days.

Mention the varieties of ulcers of the rectum.

Syphilitic, tubercular, simple chanchroidal.

Give the symptoms of ulcers of the rectum.

Morning diarrhoea, due to the ulcer suppurating all night, and filling the rectum, and being discharged as soon as the patient gets up. Later there is a good stool and more mucus. This may force out and soil the clothing, if in the grasp of the sphincter a fistula is formed.

Give treatment of ulcers of the rectum.

The syphilitic ulcer is to be treated by resting the parts as much as possible. Curette carefully. Primary and secondary symptoms treat as elsewhere, but do not put too much reliance on the iodide of potassium. Chanchroidal ulcer should be cauterized.

What is a frequent sequence of ulcers?

Stricture of the rectum.

Give the symptoms of stricture of the rectum.

History of previous ulceration. Constipation followed by an irritating diarrhoea, and always more or less mucous discharge. There is apt to be an associated abscess. The rectum is ballooned. The stricture is usually low down, so it can be reached by the finger; occasionally it is high up. Small pipe-stem stool or broken up stool with straining.

Describe the treatment for strictures.

They are hard to treat, and the patient must be under the doctor's eye the rest of his life. If low down, we dilate carefully, but do not tear the stricture. If they are easily reached cutting through posteriorly

we may effect a cure. Italian surgeons cut through both sphincters clear to the coccyx. The last resort is inguinal colostomy.

What tumors are most frequently found in the rectum?

Pedunculated mucous polypi, villous growths, carcinoma. Sarcoma is rare.

What are the symptoms of carcinoma of the rectum?

Bloody discharge, pain, tenesmus, escape of mucus and blood, and formation of malignant strictures. Often a fistula results.

What is the treatment for tumors of the rectum?

Polypi are treated by ligation and excision.

Villous growths are excised. Malignant growths—the small ones—are excised very early. If lower down do a proctectomy. Treatment of this variety is unsatisfactory. The larger ones are treated by the Kraske operation, or an inguinal colotomy.

Describe the Kraske operation.

Make an incision over the sacrum, a little to the left of the median line, turn the flaps back and remove the sacrum, with the coccyx, below the third sacral vertebra. Then remove the diseased portion of the rectum and unite the two ends or make an artificial anus.

What is the difference between a prolapsus ani and prolapsus recti?

Prolapsus ani is only a protrusion of the mucous membrane. Prolapsus recti is a protrusion of all the walls of the rectum.

What is the treatment for a prolapsus recti?

Remove the cause; astringents; linear cicatrization. The last resort is excision. Keep the bowels closed ten days with opium and then give a purge.

What is sphincterismus?

It is a spasmodic contraction of the sphincter ani.

SURGICAL DISEASES AND INJURIES OF THE GENITO-URINARY TRACT.

What questions should be asked of a patient with genito-urinary disease?

The patient should be asked about the frequency of his urination; whether it is more frequent by day or night, or on moving about; and as to the character of the stream; whether there is any pain or not and when the pain occurs, before, during or after urination, or during stool; and where the pain is located; whether any blood is found in the urine, and as to its appearance, whether bright red, dark or clotted, and if clotted, as to its shape and consistency; whether there is any sediment or not, and as to its character and time of appearance.

Under what conditions do we find increased frequency in urination?

In all inflammatory diseases, except anterior specific urethritis. In obstructive diseases (excepting early stricture), kidney diseases (especially pyelitis), polyuria (diabetes), contracted bladder, irritation from urine, calculus, tumors, neuroses and reflexly from phimosis and meatus.

What conditions cause pain and where is it felt?

Distended bladder has pain before urination. Inflammatory conditions have pain during urination. Pinched prostate and stone in the bladder have pain at the end of urination. Pain during stool often indicates an enlarged prostate. Pain at meatus, base of glands, along

urethra, in perineum or rectum, above the pubis in groin, thigh or testicle. Pain may be felt at the seat of the disease, or as referred pain. If pain from the prostate it may be referred to the meatus. Pain from ston in the bladder may be felt in the whole urethra or at the perineum. Pain from the testicle runs down the inner side of the thigh.

Mention the changes in the character of the stream and the conditions causing them.

The stream may be small, forked or twisted. It may stop and flow alternately. It may be passed with effort or drop by drop, or it may run down and not be thrown. Dribbling is caused by a tight or small meatus, stricture or enlarged prostate.

What does blood in the urine indicate?

Stone in the bladder or tumor; or it may be due to any sharp body in the bladder. It may come from the prostate or the urethra. It may come at the beginning of urination, continue during urination, and be mixed with the urine in the bladder. It may come at the end of urination and be due to the prostate or any sharp body in the bladder, or it may come from the kidneys or the ureters or from drugs. The color is variable, it may be either smoky or clotted.

How should a haematuria be treated?

Remove the cause. When the urine in the bladder is normal, even though there is great distention, leave alone. When the urine is fetid and there is great distention or obstruction, wash and break up with a tube and pump, using boric acid and then $AgNO_3$, or epicystotomy may be performed.

How can you diagnose from what part of the genito-urinary tract the blood or pus comes?

By the three glass test. The patient urinates first in one glass; if this contains shreds, pus, etc., it probably comes from the urethra. If from the bladder you will find it in the second glass. The patient finishes in the third glass and this comes from the prostate.

What points should be particularly noticed in examining the urine?

Get a specimen for the twenty-four hours and measure the amount passed. Ascertain the specific gravity and reaction. Test for albumen, sugar and urea. Any sediment should be examined must carefully with the microscope.

Describe a physical examination.

Inspect carefully from the knees to the ensiform cartilage, examining the loins, groins, penis, scrotum, perinaeum, suprapubic region, penis, scrotum and prostate. Palpate the groin supra-pubic region, penis, scrotum, urethra, rectum and loins. Percussion is used over the bladder.

What instruments are chiefly used in genito-urinary surgery?

Mercier's catheters, half dozen, Nos. 8, 12 (3), 16, and 20. French scale.

Soft rubber catheters, half dozen ,Nos. 9, 13 (3), 17 and 20.

Filliform bougies, half dozen, Nos. 6, 8, 10, 12, 14, 16.

Three English catheters, with stillette, Nos. 10, 15, 20.

Stone sound or searchers (Thompson's).

Male and female metal catheters.

Steel sounds, double-header, six pieces. 1. Nos. 18-20, 22-24, 26-28, 30-32, 34-36, 38-40.

Eight Pratt sounds. Nos. 15-17, 19-21, 23-25, 27-29, 31-33, 35-37, 39-41, 43-45; also one smaller number than these and three larger, i. e., 11-13 and 47-50, 55-60, 65-70. Do not use less than an 18 sound, but use a catheter or bougie, and under No. 6 use a filliform.

Endoscope and cystoscope; urethrometer; Otis and Maissonneure's urethrotomes; also lithotrite, pump and evacuators.

SURGERY OF THE KIDNEYS.

Where are the kidneys located?

They are entirely retro-peritoneal in the right and left hypochondriac regions, the right being a little lower than the left, this being due to the location of the liver. They lie between the eleventh and twelfth ribs, along the dorsal spine, at a point 1¼ and 2 inches above the crest of the ilium.

What is the relation of the kidneys?

The right is in relation with the liver, duodenum and colon. The left with the spleen, pancreas, colon and stomach.

What is the hilum of the kidney and of what is it composed?

It is that part of the kidney which is made up of the artery, vein and ureter, and is called the pedicle. It lies at the level of the lumbar spine and 2 inches from the median line.

What is the pelvis of the kidney?

It is the broad upper end of the ureter.

What is the perinephral fat?

It is the fat around the kidney, and is very poorly supplied with vessels.

Describe the ureters.

They are 14—16 inches long, and extend from the pelvis of the kidney to the bladder. They are ⅛ of an inch in calibre, are well supplied with muscular walls and dilatable. They are situated behind the peritoneum and enter the bladder obliquely. The narrowest portion is just where they enter the bladder; the other narrow portions are just at the beginning and at a point 1½ inches below it.

What are the methods of examining the kidneys?

Palpation, urinalysis and puncture.

How would you palpate the kidney?

Place one hand under the patient in a lying posture, the other one above. If you can feel the kidney it is out of place, or too large, except in very thin subjects.

When is puncture of the kidney used?

Only when there are tumors in the region of the kidneys and fluid is suspected.

In what direction do enlargements of the kidneys take place?

Outward and downward toward the groin.

Mention some abnormalities of the kidneys.

There may be only one kidney. They may lie much nearer the middle line. They may lie over the vessels. They may be united by a fibrous band, or we may have a horseshoe kidney. They may be normally displaced into the false pelvis (iliac fossae), or even into the true pelvis. There may be two ureters to the one kidney.

What is a floating kidney?

It is a kidney not retained in its normal position, but moving about in different directions. This condition is more frequently found in the female, and in the right kidney; also in thin people, and in those whose abdominal walls are lax.

Differentiate between floating and movable kidney.

The floating kidney has a meso-nephron. The movable kidney is loose and moves under peritoneum and has no pedicle. Surgically, no differentiation is needed.

What are the causes of floating kidney?

A lax peritoneum, the absence of fat, traumatisms. They are usually found in poorly-nourished females, in multiparae and those with lax abdominal walls.

What are the symptoms of a floating kidney?

Pain reflected to the groin, testicle and inner side of the thigh. We have also digestive disturbances, hence the patients are often treated for digestive or uterine disturbances, or even for appendicitis. The patients are thin, lax and flabby. At times there are attacks of severe pain, or you may find a movable tumor (especially on standing): debility, pulsation of pedicle, sickening pain on pinching, worse if twisted, uraemic symptoms with tumor.

How would you treat a case of floating kidney?

Not every case requires operation. Apply hot fomentations and sedatives. Put the patient on his back and give fattening foods, etc. By this we supply fat around it, which holds it in place. Massage is an invaluable adjuvant in these cases. At times we may even be able to untwist it. Many cases can be comforted by the support of a broad elastic band. If there is pain and distress, and the patient wants an operation, do it.

Describe nephrorrhaphy or nephropexis.

The patient is put on the side, semi-prone, a pillow under the side to make the loin more prominent. Incision is made ½ to ¾ of an inch below the twelfth rib and parallel to it and about four inches long. Attach the kidney to the erector spinae muscle, placing the suture deep in the substance of the kidney, and securely fasten to the lumbar fascia or the twelfth rib. For suturing silkworm-gut is better than cat-gut silk, or silver wire. Granulations anchor the kidney more firmly, therefore allow to granulate rather than stitch up. Drain to further formation of adhesions.

What is a renal calculus?

It is a collection of some of the solid constituents of the urine. They vary in character and are smooth, or sharp, and ragged; when the latter is the case they lacerate the ureters, causing haemorrhage and more pain. Some are even too large to pass out of the ureters, causing agony and destroying the kidneys.

Where do these calculi form?

Usually in the pelvis of the kidney; a large number of the small ones may form in the uriniferous tubules.

What results take place from the formation of calculi?

In children they form infarcts. When they pass through they may cause dilation, ulceration, etc. They may destroy the kidney substance, or may pass to the bladder, or may form a nucleus for a larger stone or be passed per urethram.

Of what are kidney stones made up?

The most common one is the uric acid stone, next oxalate of lime. We may also have phosphatic stones of lime, ammonia or magnesia.

What are the symptoms of a stone in the kidney?

The cardinal symptom is pain, which may be direct or reflex. The direct pain is at the seat of the trouble It is sometimes associated with tenderness. At times it is severe: at other times it is only an uneasiness. The reflex pain extends down the region of the groin and scrotum (with retraction of the testicle) and down the inner margin of the thigh. We may have haematuria. This is irregular and is possibly dependent upon the fact that the stone has moved and scraped the mucous

membrane of the pelvis. We have it especially on moving and exercising; to a less degree when at rest. There may be smoky condition of the urine or wormlike clots. Remember that the pain originating in the left kidney may be felt in the right.

What would pus in the urine indicate and how could you diagnose the stone by urinalysis?

Pus indicates a continuous irritation by the stone, causing suppuration. We usually find in the urine crystals that would indicate the kind of stone.

Mention the concomitant symptoms of stones in the kidney.

Frequency of urination, digestive disturbances, which at times overshadow the true condition. Occasionally stones in the kidneys can be diagnosed by the X-Rays.

What symptoms are caused by stones in the ureters?

Patient before the attack is usually in good health. The onset of the attack is with a sudden, violent, agonizing pain in the loin, running down the ureters, scrotum, groin and thigh. Vesical irritation, retention of urine, tenesmus and straining. The patient writhes in agony. There is cold sweat and fainting and may be collapse and death. May have uraemia, rise of temperature, etc. There are characteristic digestive disturbances and symptoms of collapse. The pain may stop as suddenly as it came; the stone either having slipped into the bladder, or back into the pelvis.

What symptoms arise when the stone is impacted in the ureter?

Continued or remittent pain, dilatation of the kidney (hydronephrosis), which may go on to pyonephrosis, perforation and extravasation. uraemia, septicaemia and peritonitis. The characteristic symptom is that the patient accurately locates the stone.

How can you aid the diagnosis of passage of stone from the kidney?

By feeling the base of the bladder through the rectum or vagina, or by doing an abdominal section.

Where is the stone most apt to be impacted in the ureters?

Just at its entrance into the bladder, because this is the narrowest point.

Describe the treatment for renal colic.

Use chloroform, morphia and atropine to the extreme, to avoid pain and to relax the spasm. Hot baths are given for the same purpose. You must overcome constipation because pressure is increased by it. The bowels can be moved by enemata or a calomel purge. If the attack has passed off, try and prevent another. Watch for the stone. If it is in the bladder you can give demulcent drinks, or bicarbonate of soda. Liquid diet, no red meats, but vegetables and white meats. When the stone stays in the pelvis the treatment is the same, only keep the patient quiet, etc. Berberis and nux vomica may be indicated.

What is nephrolithotomy?

It is the removal of a stone from the kidney. The incision into the kidney should be at its free border; if you cut the pelvis you are likely to have extravasation of urine. Always palpate the kidney for stone before incising. Before excising, also see if there is any function.

How would you treat a stone in the ureter?

Make an incision through the loin at the crest of the ilium. You may then raise the peritoneum and follow the duct to the pelvis of the kidney. When the stone is near the bladder it must be attacked from below. In females you can operate through the roof of the vagina; in the male you can do an epicystotomy. Kraske's operation has been recommended and practiced.

In what does an injury to the kidney differ in the male and female?

In the male, as a rule, it results in a laceration of the kidney substance. In the female we have more frequently a dislocation of the kidney.

Mention the causes of contusions or lacerations of the kidney.

They are usually resultant from direct violence, especially from crushing of the loin, from blows, falls in the sitting posture.

What are the results of contusions or lacerations to the kidney?

Haemorrhage, extravasation of urine, and injury to the surrounding structures. We may have all sorts of injuries from a little tear of the cortex or a ruptured capsule to a complete splitting or crushing of the kidney.

Give some characteristics of a haemorrhage from the kidneys.

It is first seen in the urine. At first it may be bright red, later it may clot and we may find strings or worm-like clots, which come from the pelvis or rather the ureter. They usually produce symptoms of renal colic. After the haemorrhage is lessened we get a regular kidney haematuria, which gives a smoky urine. If the clot lodges in the ureter and cannot get down, there is distention of the kidney itself. If clots do not form the patient may bleed to death through the meatus.

What are the varieties of extra-renal haemorrhage?

Intra-peritoneal and peri-renal.

Intra-peritoneal haemorrage has a bad prognosis. The peri-renal is in a degree self-retaining.

Mention some important symptoms of renal haemorrhage.

If the haemorrhage is not severe, we have simply a haematuria. In severe cases we have a tumor in the loin. There may be an ecchymosis of the thigh, groin or scrotum due to haemorrhage of the kidney. Haemorrhage into the peritoneum is usually abundant and rapidly fatal.

What is a spurious hydronephrosis?

This is a large cyst caused by extravasation of urine into the peritoneal cavity. It is of traumatic origin and may go on to suppuration, systemic infection or sloughing. It is, however, not as bad as extravasaton from the bladder or urethra, as the urine is more septic when in the bladder than when in the kidney.

What are the symptoms of contusion or laceration of the kidney?

Tumor in the loin with a characteristic direction. Pain diffused and localized. Reflex pain down the groin to the testicle and down the inner side of the thigh. With extravasation of urine, think of haemorrhage and septic peritonitis.

Describe the general treatment for injury to the kidney.

Rest first. Some go farther and strap the right side of the chest and loin. Apply cold to the part. Remedies, chiefly ergot.

Would you give a purge to relieve the constipation in such cases?

No. Because the increased peristalsis of the intestine would be liable to start another haemorrhage; use, therefore, only enemata.

What is the operative treatment for injury to the kidney?

If blood fills up the bladder with clots, you must break up the clots and wash them out with boric acid. If the tumor in the loin gets bigger and the patient is losing ground, or clots are breaking down, incise and evacuate the pus or clots, as the case may be. If there is no tear in the kidney you may pack. If torn beyond the ability to restore you may excise the kidney.

How are wounds of the kidney caused?

Chiefly by gunshots or stabs.

Give a general description of wounds of the kidneys and their treatment.

They occur through the abdomen or loin. The intraperitoneal variety are very fatal; the extraperitoneal are less so, but perinephral abscess often follows.

The treatment for the extraperitoneal variety is the same as for ordinary wounds. Extirpation of the injured kidney in intraperitoneal wounds is usually necessary. If the wounds are not treated abscesses may form.

What are the chief causes of wounds of the ureters?

Gunshot wounds and operations, the chief of which is the removal of uterine fibroids. It rarely results from rupture.

Give the treatment for an injured ureter.

Formerly they removed the kidney when the ureter was injured, now surgeons try and save the kidney. First they brought the ureter out through the skin, now they try and restore by lateral implantation, or implantation into the bladder or intestine.

What is lateral implantation of the ureter?

The lower end of the ureter is closed and an opening is made in the side and the upper end is introduced and united by means of an intestinal suture.

What methods are used to overcome strictures of the ureters?

Transformation of a longitudinal into a transverse cut.

What causes perinephritis?

It is due to scar formation, which produces tremendous adhesions. It sometimes results from urinary extravasation or fistula. Occasionally from metastasis or migration from the bladder. Suppuration of the kidney may cause it. Extravasation of urine. Renal calculus. Suppuration of the liver or gall bladder. Rupture of the ureter or pelvis.

What are the symptoms of a perinephritic abscess?

Tumor, pain, tenderness, rapid pulse, chill, sweat, symptoms of septicaemia and pyaemia. You may not get fluctuation, so you must then puncture or explore on the above symptoms.

What direction does a perinephretic abscess take?

(a) It gets larger and larger and points in the loin. (b) Downward and inward toward the groin. They may point toward Poupart ligament or in the groin. (c) They may go up and become subphrenic, then they may rupture into the chest, followed by collapse of the lung, septic pleurisy and death. Or it may progress slowly, forming plastic tissue, and rupture into the lung tissue, and there cause symptoms of lung abscess. (d) Occasionally it may break into hollow organs.

What is the treatment for perinephritic abscess?

Good surgery.

What is the origin of kidney abscesses?

(a) They may be metastatic, (b) infection from the bladder. They are liable to rupture into the pelvis. They are small and cannot be recognized and are not operated.

What is a surgical kidney?

Surgical kidney is a misnomer, as it does not result from surgery, but from bad surgery. It is a kidney with suppurative inflammation of the kidney substance and pelvis. If you could see it early it would be a pyelitis, but later it is a pyelo-nephritis. It may be secondary to suppuration, below in urinary tract. It is often seen after surgical operations below, but is more often due to delay, or lack of, or dirty surgery.

What are the causes of pyelo-nephritis?

Infection from below, stone, inflammation with infection, tuberculosis of the pelvis and tumors.

What are the varieties of pyelo-nephritis?

Catarrhal, tubercular and suppurative.

Mention the symptoms of a pyelo-nephritis.

They are vague and indefinite. In general those of threatening uraemia. Symptoms of bladder and urethral disease, usually a history of instrumentation. Dull aching pain in the region of the kidney, which is likely to be called lumbago by the patient. We may have the reflex pains in the groin, scrotum and inner side of the thigh. Tenderness on handling the kidney and rigidity of the muscles. The urine is always acid, contains spindle and caudate cells of the kidney and is smoky, and in the tubercular variety the tubercular bacillus is found; also blood corpuscles, and, later, mucus and pus. Gradually it develops into a typhoid state, and if the kidney is affected uraemia will develop. Stupor and evening rise of temperature, and later the typhoid condition.

Give the characteristic symptoms of an oncoming uraemia.

The patient is not in his right mind, he speaks queerly, and the characteristic symptoms develop.

Describe the treatment for a pyelo-nephritis.

The best treatment is the preventive. Always use sterile instruments. Study the urine to see if the kidneys are normal; by this we can always decide what anaesthetic to use. Ether produces irritation, causing albuminuria and haematuria. Therefore, if there are no heart contraindications use chloroform. If a large amount of pus is present do a nephrotomy.

Give the chief remedies for a pyelo-nephritis and the chief indication.

Mercurious corrosivus, when slight symptoms show an oncoming uraemia. Cuprum arsenicosum, when symptoms of retention manifest themselves. Cantharis, during the uraemic convulsion.

Where does tuberculosis of the kidney start?

It may start in the kidney substance. Oftener we think it starts in the pelvis of the kidney spreading to the substance. Sometimes we find it as an independent lesion in the kidney, which may become encapsuled and become inactive, until the patient is exposed to a cold.

What conditions predispose to a tuberculosis of the kidney?

Adolescent male after gonorrhoea, involving the testes; usually the lung, testicle and prostate are involved at the same time. Heredity is another predisposing condition.

Give the symptoms of a tuberculosis of the kidneys.

Acid urine; irritation of the neck of the bladder; sooner or later, some haematuria; early mucus, later pus passes with the urine. Evening rise of temperature, indicating sepsis. Complication of lung tuberculosis and finally tubercle bacilli, in the urine.

Give the treatment for tuberculosis of the kidney.

The lower lesions, those of the testicle and bladder, need attention. Beyond this the treatment is constitutional. Nephrectomy is not practical because both kidneys are often affected. Nephrotomy may at times be needed when pus is present. The diagnosis is hard. Quite frequently this condition is treated as an irritation at the neck of the bladder.

What has nephritis to do with burns and operations?

Burns often cause nephritis. Every operation in case of nephritis is dangerous because the wounds will slough. In operations on the genitals it will cause uraemic symptoms.

What is hydronephrosis?

It is the retention of the excretion of the kidney due to obstruction to passage of the urine somewhere along the urinary tract.

Mention the causes of hydronephrosis.

They are numerous. They may be congenital and may then interfere with parturition. One-half of all acute cases are due to impacted calculi in ureter, high or low. Clots of blood may produce an obstruction; or hyadid cysts of the kidney. Next we have tumors outside the kidneys, or cicatrices within the ureters causing obstruction. Pregnancy is liable to produce hydronephrosis, when the uterus is very large. It may be further down, as obstruction in the prostate; perhaps through enlargement, stricture of the urethra, or a pin hole meatus, or a tight phymosis. Occasionally there is frequent micturition, due to constant contraction of the bladder, constantly shutting off both orifices of the two ureters.

What are the two cardinal symptoms of hydronephrosis?

First, tumor in the loin and abdomen, rapidly increasing and fluctuating, pushing the colon ahead. Second, sudden decrease in the size of the tumor, after a flow of a large amount of urine. The tumor is sometimes enormous, extending downward and inward to the groin. When large enough to palpate you will get fluctuation.

What are the contents of a hydronephrosis?

Urine of a very low specific gravity; amber-colored. Generally contains small quantities of albumin, urea, mucin, etc.

Give the prognosis of hydronephrosis.

It is grave when both kidneys are affected, as they are apt to atrophy.

Differentiate hydronephrosis from an ovarian cyst and ascites.

The chief point is that the ovarian cyst begins below in the pelvis and grows upward. Hydronephrosis begins above and goes downward. In ascites the intestines float on top, and by changing position the tympanitic percussion note changes too.

Describe the treatment for hydronephrosis.

In calculi, massage of the loin will often help. Harrison's method is to over-distend the bladder. In the female you may catheterize the ureters. You may also aspirate to diagnose and repeat it as a curative feature. If this fails, incise and drain. After the sac is settled down, if the kidney is injured, do a nephrectomy.

What is pyonephrosis? Give symptoms.

It is the change of hydronephrotic fluid into pus. The symptoms are those of hydronephrosis plus pyuria, with a gush of pus instead of urine or water. Chill, fever, sweat, symptoms of septicaemia and death.

Describe the treatment for pyonephrosis.

This must be more energetic. Open the sac as soon as you notice pus. You may pack it, and later take it out.

What kind of cysts do we find in the kidney, and what are the symptoms?

Congenital cysts. These are usually hydronephroses, and if so, they interfere with delivery in labor. In the child we have retention cysts due to calculi in the uriniferous tubules. They are often found post-mortem in cirrhotic kidney. Sometimes they are large (simple or serous) and resemble a tumor till they fluctuate. Symptoms and treatment the same as hydronephrosis. Hyatid cysts are also found in the kidneys.

A slowly growing tumor in the groin without urinary symptoms. The tumor may increase rapidly from haemorrhage. It grows from the cortex outward. It contains a straw-colored substance, which may be jelly-like or thin.

What is the treatment for cysts of the kidney?
Tapping and incision and, occasionally, subsequent nephrectomy.

Describe a hyatid cyst of the kidney.
It is a cyst due to the echinococcus. They are less frequent than in the lungs or liver. It is especially found in the male and is not common in this country. Oftener found in the left kidney. They usually begin in the substance of the kidneys, which become distended, and they are often emptied into the pelvis. They may shed shreds and stop up the ureters. If large they must be tapped and then you can see the hooklets, which are drawn off.

What are the symptoms of hydatids of the kidney?
Vesicles in the urine, renal colic, bladder symptoms, urethral obstruction, smooth tumor in the loin, and hooklets found on puncture.

How are hydatid cysts of the kidneys treated?
Incise, suture sac to the skin, drain and pack.

At what ages would you expect to find tumors of the kidneys?
Before five years of age and after thirty years. If under five we can almost always say it is sarcoma. If after thirty it is usually a carcinoma. Hence with the diagnosis of a solid tumor of the kidney goes the inference that it is a malignant one.

What are the symptoms of a tumor of the kidney?
Those of enlargement. Solid, smooth, round tumor; the tumor grows toward the groin and is not like the liver or spleen. As it grows downward and forward it pushes the resonant colon ahead. We may get the finger between the tumor and the ribs and so differentiate it from the liver at once. Intermittent haematuria. After their removal they return. Pain. Many mistakes are often made as the pain may be referred to the knee. We may have limping due to pressure on the psoas muscle.

What is the treatment for tumor of the kidney?
Early extirpation.

What are the causes of urinary fistulae and where are they found?
Injuries or operations may cause them (incisions of the pelvis or urethra). They do not come from the substance of the kidney. They may be anywhere from the loin to the groin. Urinary fistulae in the loin are not always from the ureters, but may come from the bladder, ruptured abscess, etc.

How are urinary fistulae treated?
Clean out, try to pack and divert the stream, cauterize. For cauterizing we have two reasons—stimulation and cicitrization. The cauterants are argentum nitricum, nitric acid, or hot iron. If there is constant suppuration of the sinus, which is disgusting to the patient, and dangerous, examine the other kidney, and when found normal, excise the diseased kidney.

What is nephrectomy?
It is an extirpation of the kidney and is occasionally done as a primary operation, but should always be done secondary to a nephrotomy, or nephrolithotomy.

What are the indications for nephrectomy?
When the kidney is disorganized and useless. You must be sure that there is another kidney, and that it is doing enough work, hence nephrectomy is always secondary. The compensating kidney always grows. You can find out whether it is reliable by observing its function. In the female you can catheterize and observe the amount and kind of urine excreted by the other kidney.

Describe the sacro-lumbar nephrectomy.

An incision is made parallel to the twelfth rib. This may be supplemented by a vertical incision. Then enucleate the kidney and isolate the stump or pedicle from the fat. Tie the pedicle in two pieces, one to contain the ureter, the other the artery and vein. You may leave the clamps on for some time after the operation. Tie the vessels and cut when the pedicle is not tense. The ureter can be dropped back. When diseased, bring out through a wound in the loin. If the kidney is very large you may throw an elastic ligature around it. The wound, as a rule, is allowed to granulate.

Describe an abdominal nephrectomy.

Incise in the semilunar line at the level of the umbilicus, nick the peritoneum outside the colon and remove the kidney.

What are the advantages of an abdominal nephrectomy?

You can tie the pedicle much easier and examine the other kidney.

Give indications and contraindications for nephrectomy.

Floating kidney and tumor indicate an abdominal nephrectomy, the latter is contraindicated in infections and inflammations.

SURGERY OF THE BLADDER.

Mention some anomalies of the bladder.

There may be no bladder at all (very rare), or multiple bladders, or extrophy of the bladder.

Mention the accompanying conditions in absence of the bladder.

The ureters open into the vagina, urethra, rectum or umbilicus. Treatment is usually useless.

What can be said of multiple bladders?

This is a very rare condition. If found, it is usually double, with double penis and urethra. One case is reported of five bladders. Usually they are mere sacculations.

How would you make a bladder if it was absent?

Take the most convenient loop of gut, cut out a section, preserving its mesentery, unite the ends of the gut below and above the excised section. The ureters are introduced into the section and it is connected with the urethra. This is as yet an experiment made upon dogs.

Describe extrophy of the bladder.

This is a distressing and loathsome condition, in which there is a defect in the symphysis pubis and anterior bladder wall. The bladder is turned out. This results in an irritation of the mucous membrane by air and clothing, causing cystitis and erosions, and sloughing may occur, followed by septic urethritis, pyelitis, pylo-nephritis and death. There is often difficulty in determining the sex. Frequently the roof of the urethra is wanting, giving us a condition known as epispadias. Often a defect is found with it in the inguinal canal, giving us a double inguinal hernia. There is a bulging fungating mass, stinking ammoniacal urine, eroded skin and exposed ureters.

Describe the operation of Wood for extrophy of the bladder.

Make an anterior wall for the bladder by turning down a flap of skin from above, with the skin surface towards the bladder. Make sliding flap to cover the raw base. The remaining raw surfaces are partly closed by sutures and finished by skin grafts. This is an operation for females.

Describe the operation of Roux-Maury.

Get a flap of skin from the scrotum. This is lifted up and turned over the penis, with a hole for that organ, and fastened skin inward.

What prognosis can you give for extrophy of the bladder?

You cannot make a sphincter for the bladder, and the patient must carry a urinal. Many attempted plastic operations will be unsuccessful. If successful at all it will take many operations.

Give causes of cystoceles.

Obstructive diseases with certain amount of distention of the bladder and straining of the patient, also weak points in the abdominal wall. Cicatrices, especially following supra-pubic sections or inguinal or femoral hernia. Lacerations of the perineum.

Mention the symptoms of cystoceles.

Soft fluctuating tumor which has a cough impulse. The size varies according to the amount of urine in the bladder. It is often sacculated and contains a stone. The bladder cannot be completely emptied.

Describe the treatment for cystoceles.

It is palliative and operative. Palliative:—truss. An ordinary pad in a reducible one, and a cup-shaped pad in an irreducible one.

What are the causes of a ruptured bladder?

Direct violence over the bladder region when it is full. Wounds, both bullet and stab wounds, through hypogastrium, rectum, vagina, or sacro-sciatic foramen; or instrumental through the urethra, or operations upon the ureter and rectum. It may accompany fractures of the pelvic bones, and occasionally results through straining when the bladder is too full. Distention by the surgeon is more dangerous.

Where is the bladder most usually ruptured?

Posteriorly, if healthy. If diseased, then at the diseased point. If due to instruments, then at the point of contact. The extravasation of urine is extra- or intraperitoneal. The extraperitoneal extravasation is into the loose connective tissue, and around the bladder in the cavum Retzii between the bladder and rectum, or the bladder and uterus.

Where is the cavum Retzii?

It is bounded by the anterior wall of the bladder, the peritoneum, abdominal wall and the symphysis pubis.

Describe the symptoms of rupture of the bladder.

If intraperitoneal we get a rapidly-developing peritonitis, shock and rapid death. If extraperitoneal we get the characteristic infiltration, pus, septicaemia and death.

How could a ruptured bladder be diagnosed?

History of some injury plus (sometimes) collapse. The symptoms may be of slower onset when there is a small leak. Inability and difficulty in urinating. If in doubt whether membranous urethra or bladder is ruptured, pass sound. If bladder is ruptured may draw off blood-stained urine, or catheter pass into hole, or inject aseptic air or fluid inside of bladder. If a urethral catheter you should not pass it any farther back.

Give the prognosis of rupture of the bladder.

It is grave. Severe cases die in from a few days to a week. The condition is so grave that one is justified in undertaking any sort of an operation.

Describe the treatment for a ruptured bladder.

There are two ways of treatment. First—Perineal section; then insert the finger and find the rent. Secondly (better)—Epicystotomy. If the urine is prevesicle, drain the opening; or you can open into the bladder and find the tear. Drain if extraperitoneal. If intraperitoneal lengthen the wound, find the tear and then perform abdominal toilet and drain.

Give causes for retention of urine.

There are two classes. First, obstructive; second, paralytic. Of the obstructive, stricture and enlarged prostate are the most common causes. Others are, acute or chronic hypertrophy, impacted stone, tumors pressing on the ureter, pin hole meatus, faeces and gravid uterus. Of the paralytic, we have atony following shock of any kind. This is met with in long-lasting fevers, excessive muscular exhaustion, ordinary atony of the bladder, injuries to the spine and head, reflex influences from operations on adjacent organs. Drugs which produce it are opium, belladonna, alcohol and cantharis.

What are the symptoms of retention of urine?

Extreme desire to urinate. Straining to pass urine which is excessive. May have prolapsus of the rectum, haemorrhoids or internal haemorrhoids turned out by the straining. Sooner or later there is a relief from the overflow, which simulated frequent urination. There is a tumor which gets hard as the bladder tends to contract. Dullness on percussion. Supra-pubic pain. Finally we have back telling which is an inflammation due to the decomposition of urine, causing distention of the ureters and the pelvis of the kidney. The stroma of the kidney is pressed upon and atrophies, pyelitis, pyelo-nephritis, and sometimes uraemia result, with chill, fever, failing pulse, etc.

How would you treat a patient suffering with retention of urine?

By hot Sitz baths, anodynes, etc. Try to enter the bladder by way of the urethra. Use the largest sized catheter and the softest one you can get. If the prostate is enlarged use a Mercier catheter. Supra pubic aspiration becomes necessary if you cannot catheterize. This may be done repeatedly. Aspiration through the perineum may also be done.

What is atony of the bladder?

It is a weakened condition of the muscular walls, so that it is unable to empty itself. The result of this will be residual urine, which decomposes, setting up a cystitis. Later the inflammation may spread up the ureters, causing inflammation of the kidneys, uraemia and death. Sacculation is not infrequent.

Mention the causes of atony of the bladder.

It is due to obstruction and over-distention. It occurs mostly in the male sex when the prostate enlarges. Previous paralysis of the bladder, over-distention from holding the urine too long, from fibroids, or enlarged prostate or tumors near the prostate, and from strictures.

Give the symptoms of atony of the bladder.

Frequent urination, dribbling, and residual urine will be found on using the catheter.

Describe the treatment for atony of the bladder.

Empty the bladder by means of a catheter. The rule is, use the catheter once in every twenty-four hours for every four ounces of residual urine. Wash the bladder to improve the cystitis. Correct the lesion which produced the trouble. Use cold water or Farradic current. Nux vomica for paresis, or strychnine. If the condition cannot be overcome use the urinal. Watch for ammoniacal cystitis.

Differentiate between concentric and eccentric hypertrophy and dilatation of the bladder.

In concentric hypertrophy we have thickening of the bladder wall with lessening of the cavity.

In eccentric hypertrophy thickening of the bladder wall with increased cavity. In dilatation we have thinning of bladder wall with with lessening of the cavity.

Differentiate between sacculation and pouching of the bladder.

Secculation is a hernia of the mucosa through the weakened muscular layers, taking place between the muscular trabeculae. Such a hernia can occur at any place and at any age.

What are the diagnostic symptoms of sacculations of the bladder?

Sacculations may be felt through the rectum or vagina. The urine flows and then ceases; then, by changing the position of the body or catheter, there is a fresh flow.

What are the results of pouching of the bladder?

Residual urine. Formation of calculi within the pouches. Frequently decomposition and septic conditions.

Give the treatment for pouching of the bladder.

It is very unsatisfactory; the bladder should be drained (best by supra pubic section).

What is nocturnal enuresis and give causes?

It is the wetting of the bed on first going to sleep. The causes are tight meatus, worms, or some other irritating conditions.

How would you treat nocturnal enuresis?

It may be necessary to pass a cold sound. Occasionally injections to the prostate of $AgNO3$ may be useful. Tell the patient to urinate before going to bed and not take any liquids at bedtime. Remedies are nux vomica, belladonna, causticum, sulphur.

What are the varieties of cystitis?

May be acute or chronic.

Acute cystitis is a serious condition. It is due to wounds, careless, dirty sounding, foreign bodies, as the breaking off of catheters. Drugs, as cantharis or turpentine, or drugs introduced into the urethra. Back telling, an inflammatory process gradually working back, is a cause and often due to gleet. Stricture may be another cause. Infection from gonococcus, staphylococcus, streptococcus, tuberculosis, etc., and tumors may be causes.

Give the pathology of cystitis.

In mild cases the mucous membrane is red, swollen, congested, with more or less necrosis, usually erosions and ulcerations. Formation of false membranes. Severer forms may go on to suppurative peritonitis, paralytic cystitis, or ureteritis and pyelo-nephritis, or ulceration and even sloughing.

Mention the symptoms of cystitis.

Severe chill when the type is a severe one. In subacute we have a subacute fever. One of the first symptoms is frequent urination, with tenesmus and long-continued straining, and if the urine passes through the urethra it feels like hot coals. The bowels usually move when the patient urinates. Prolapsus ani and recti are common. Pain in the bladder and pain over the pubis, perineum and inner side of the thigh, at the end of the penis and in the urethra.

The urine is high colored, scanty and turbid from urates or blood; and there is blood at the end of urination. Pus is mostly present in the urine.

Give the constitutional symptoms of acute cystitis.

These vary. There is usually fever, sepsis, uraemia and peritonitis. The symptoms become more marked as the prostate becomes involved.

Give the treatment for cystitis.

Remove the cause and relieve the pain. Turpentine and cantharis are the best internal remedies. Large hot rectal enemeta should be given. Opiates or opium and belladonna suppositories should be given. The

patient should have lots of water, flax seed tea, milk and bicarbonate of soda water. If not promptly relieved drain the bladder.

What are the causes of chronic cystitis?

It is always secondary to some other pre-existing conditions, as stricture, hyperthrophied prostate-gonorrhoea, stone or tumor in the bladder, rectal abscesses, etc., or a combination of obstruction, decomposition of residual urine and instrumentation.

Give the symptoms of chronic cystitis.

Frequent urination, calls urgent. Passing of gobs of mucous and phosphatic crystals, rarely blood. Slight pain at end of urination. Tenesmus less severe than in the acute form. Stinking ammonical odor. Renal symptoms due to backtelling.

Describe the treatment for chronic cystitis.

Find and eliminate the cause. Irrigation and drainage. Liquid diet, diluent and softening drinks. Keep the bowels open. Remedies are cantharis, terebinth, cannabis sativa, uva ursi and pareiva brava.

What is the disadvantage of a two way catheter?

Does not distend, or flush walls of bladder.

What are the methods of draining the bladder?

Perineal and supra-pubic. The supra-pubic drainage is the one chiefly used.

What are the chief constituents of the urine?

Organic and inorganic solids, 10 per cent. Water, 90 per cent. Organic solids. Uric acid, one part in a thousand. Urea, mucus and epithelium. Inorganic solids are Na. K. Mg., forming urates, phosphates, sulphates and chlorates.

Name some of the causes of stone formation.

They are formed through the precipitation of the solids of the urine, aided by a nucleus due to the predisposing factors, which are stagnation, defective digestion, assimilation, oxidation, etc.; age, especially children and old men. Sex, male, females, 5 per cent., as they have large, short urethras. Race, white. Negroes seldom affected. Locality, where the water is rich in calcareous constituents, etc. Local diseases.

What three constitutional conditions favor the formation of stones?

Gout, lithaemia and rheumatism.

What local conditions favor the formation of stones?

Atony of the bladder, catarrh and strictures.

What size and number are urinary calculi?

The size varies from a pin head or pea to the size of the fist. The number from one to several hundred.

What are the varieties of stone and where does each variety originate?

(a) Primary. Occur in acid urine and originate in the kidney, especially in the young; they are made up of uric acid, sodium and ammonium urates, calcium oxalates, cystine, etc.

(b) Secondary. Usually found in alkaline urine, and occur in old people in the bladder. It is deposited around a primary stone. Sometimes they are formed in the kidneys of the carbonate or phosphate of lime. The phosphatic calculi are the softest.

Give the symptoms of stone.

(a) History, including previous attack of colic, and passage of gravel; obstruction to the flow or catarrh of the bladder.

(b) Frequency of urination, due partly to size and character of the stone. The smaller the stone the more frequent the urination. Exer-

cise also increases the frequency of urination. More frequent urination in young subjects.

(c) Character of the stream. If there is a loose stone, the patient can start to urinate, but the stream is interrupted, and he has to change position before he can finish.

(d) Sooner or later there is blood at the end of urination and on motion.

(e) Pain. Reflex symptoms to thigh or heel.

(f) Urinalysis shaws blood pus and excessive uric acid and oxalate of lime crystals, and cystitis.

What is the characteristic pain of stone in the bladder?

It is variable. Large, soft stones may not have any. Sharp, rolling stones are very painful. The pain is referred to the perineum and rectem, runs along the urethra and causes prolapsus by straining. There may be elongation of prepuce by involuntary pulling to relieve. It may cause semi-erections, enlarged penis, reflexes to thighs, back, etc., "podalgia."

What is the pathognomonic symptom of stone in the bladder?

It is the actual clicking of the sound against the stone. Such sounding should be done systematically. Introduce to the posterior surface and come forward, feeling carefully one side and repeating on the other. Usually the bladder need not be distended, four ounces of liquid being enough. We may get the sound of the stone on the instrument by withdrawal of the water. May have to change the patient's position. You must measure the stone when you find it. The last resort is the lithotriscope. You must determine whether the stone is loose or encysted. If you are an expert you may use the cystoscope. Do not work recklessly, and do not search for it on a cold, damp day, on account of urethral fever. Anaesthesia may be needed. Aids: Billroth's resonator, supra-pubic and rectal pressure.

What errors may occur when searching for stones in the bladder?

The promontory of the sacrum, impacted faeces, tumors, etc., may be mistaken for the stones. On the other hand the stone may be in a pocket, or covered with mucus and blood and not discovered, hence repeated soundings are necessary.

What is the treatment for stones in the bladder?

The non-operative treatment is of little use. Watch and treat cases of enlarged prostate or stricture with atony or catarrh. Prophylaxis after you have operated or where you suspect stone. Give plenty of milk, water, lime water, little meat only. Avoid perspiration, exhaustion and diarrhea. Cut down sugar and fats and avoid alcohol.

What operations are done for stones in the bladder?

Lithotomy or lithotrity (cutting or crushing).

What are the cutting operations?

The supra-pubic section or epicystotomy and perineal section. The cutting operation is the best for the average man. The crushing operation is more for the genito-urinary expert.

Describe lithotrity.

Lithotrity is the crushing of the stone by means of the stone crusher, introduced into the bladder through the urethera. It was popularized by Civiale (1823), devised an instrument, but Bigelow, in 1879, removed the whole stone in one sitting, which made the success more possible.

What are the indications for lithotrity?

Nearly all moderate sized stones up 1½ inches, if they are not too hard. You can judge the hardness by the click of the instrument. Every thing should be in readiness for a cutting operation. There should be

no stricture; if there is one it should be cured first. Enlarged prostate is an impediment. You dare not operate if there is atony or diseased bladder wall.

What preparations should be made for lithorrity?

Accustom the urethera to the instrumentation. Render the bladder clean and the urine acid. As a rule four ounces of urine is all that is necessary to work in. If there is too little fluid it is called a fish bite. Always play in one spot and pump with respiration, filling in with inspiration. Need not use much force. Leave the catheter in a few days and give aconite to prevent fever. Residual urine and fragments may be left from the operation, therefore examine every few days.

What are the complications of lithotrity?

Urethral fever, bleeding, septic cystitis, epididymitis, peritonitis and infiltration.

What are the indications for supra pubic lithotomy?

Deep or rebellious strictures, small, hard stones; any small stone with diseased bladder wall. After crushing, when the fragments are not removed. It is also used as a combination with the crushing method, in diseased kidneys, in preference to crushing.

Describe lateral lithotomy.

An incision is made one inch in front of the anus, and carried two inches toward the left, between the anus and the tuber ischii. Cut through the urethra and prostate below the bulb and enlarge the wound by cutting in the left lobe of the prostate. This operation is used especially in boys and in cases with large stones, as it gives more room for the removal.

Describe median lithotomy.

The incision is made in the median raphe between the scrotum and anus, the patient being in the position for the lateral operation. A groove director is introduced into the urethra and held closely against the arch of the symphysis. Insert a narrow, straight bistoury at the perineal centre and push on till it reaches the groove director. Make an incision in urethra three-fourths of an inch long. Insert forefinger into wound and on through the prostatic urethra into the bladder. Withdraw groove director and introduce the forceps. There is danger of wounding the urethral bulb. Hemorrhage is slight, as but few vessels are cut.

What dangers arise from lithotomy?

(a) Bleeding. Better tie the vessels, or if the bulb is injured, better use a petticoat catheter or water bag to the catheter. This stops bleeding by pressure.

(b) Extravasation of urine is another danger. This is more apt to occur in the lateral operation and causes a septic peritonitis.

(c) Creating a vesico-rectal fistula is another danger.

(d) In the lateral operation, there is danger of division of the vas deferens, or vesiculae seminales.

What is the after-treatment of lateral lithotomy?

Leave in a tube for the urine; this to be removed as soon as the urine will pass through the urethra. We must sound to prevent stricture. Usually we need not fear residual urine.

Describe supra pubic lithotomy.

Best done in two tempos. Make an incision in the median line or linea alba, stopping about one-quarter inch above the symphysis pubis. Cut down to, but not into the bladder. This is the first part of the operation. As soon as granulations have formed you can open the bladder. Trendellenburg position makes the introduction of water or air

into the bladder needless. Drain with a "T" tube or two tubes. Must protect the dressing. Gauze is better than absorbent cotton. Close up if no residual urine, enlarged prostate or catarrh. The best suture is the Zesas, backward and forward, deep and superficial suture. The deep is interrupted, anad the superficial continuous. Then distend the bladder to see if it is water-tight. We leave the wound open for one week to test the integrity of the suture.

What are the indications for suprapubic lithotomy?

Large and hard stones, enlarged prostate, residual urine, chronic cystitis, sacculation of the bladder and diseased kidneys.

How are stones removed from the female bladder?

They can be removed by dilatation of the short urethra, extracting them by forceps; or, you can crush and use the pump. Some open into the bladder through the vagina. This is not advisable as a permanent fistula often results. Epicystotomy is now popular and better than through the vagina.

Name the benign tumors of the bladder and tell where to find them.

Papillomata (the common villous growth). They occur near the urethra. They may be large or small, sessile or pedunculated. They bleed easily and may be irritated by the urine, setting up an inflammation and ulceration of the bladder. They spring from the mucous membrane only. They may spread away from it, becoming heterolagus. Myomata and fibro-myomata are oftenest found in the prostate, but in the young we may find them hanging loose in the bladder or hanging in the urethra. They spring from the sub-mucosa and form the majority of mucous polypi.

What malignant growths do we find in the bladder?

Sarcomata and carcinomata. The sarcomata are rare and resemble polyps. They are usually of the round celled variety. Carcinomata are more common. It may be ordinary glandular carcinoma, primary or secondary to cancer of the prostate or other places. We find metastases occurring rapidly. They ulcerate quickly.

What are the important symptoms of tumors of the bladder?

Haematuria, irritation of the bladder. Agonizing pain and putrid cystitis. Bleeding is characteristic of papillomata, worse after active exercise and the use of instruments. Sometimes you can diagnose by bimanual examination. Papillomata are diagnosed by shreds, which are carried away in the urine and can be examined under the microscope. Can use the cystoscope when particularly skillful. Finally an exploratory incision may be made to diagnose.

What is the treatment for tumors of the bladder?

Epicystotomy in the Trendellenburg position is the best. By use of the head-mirror, and electric light we may twist, tie, clamp, or cut off. We may work through a female speculum of hard rubber. The special treatment for hemorrhage is the application of very cold or hot water. If you can reach it, touch with the cautery. May use Keye's pack. Perineal cystotomy has been done to remove tumors, but only when near the urethra or prostate, or pedunculated.

What can be said of the intraperitoneal cystotomy?

It is of value in operating for stones complicated with tumor, encysted stones, for stones in small rigid bladders, or for stones associated with conditions indicating manual examination of the kidneys, and for small growths.

Treatment: If the urine be foul, wash several days previously with a saturated boric acid solution, and distend the bladder at the time of operation with the same. Incise from umbilicus to pubes, being careful

not to open the prevesical space. With patient in the Trendellenburg position, draw out the intestines and pack cavity with sterilized absorbent cotton covered with gauze. Make a two or three-inch incision in the median line of the bladder, beginning about an inch behind the junction of the abdominal and vesical peritoneum. Dissect back the peritoneal coat one-fourth of an inch to either side of the incision. Withdraw the fluid and cut into the bladder. Perform whatever operation is necessary within and stitch the muscular coat up by a continuous silkworm gut or silk suture, not including the mucous membrane. Unite peritoneum by continuous right angle or Lembert suture, remove gauze, cleanse cavity thoroughly and close the same by the ordinary method.

SURGERY OF THE PROSTATE.

Describe the prostate.

It is a body surrounding the neck of the bladder and proximal end of the urethra. The urethra passes through it at the junction of the upper and middle thirds. There are two lateral lobes and an isthmus between. A grove above and below forms the isthmus. The third or middle lobe is a pathological overgrowth of the isthmus. It rests against the posterior surface of the triangular ligament, on account of which it cannot grow forward. On account of the pubo-prostatic ligament, it cannot grow upward, and because of the pelvic fascia it cannot grow downward, hence it must grow backward.

Give the histological appearance of the prostate.

It is made up of two layers of unstriped muscular fibres, between which are glandular follicles lined with columnar epithelium, whose function is to secrete the prostatic fluid which dilutes the semen. They open by a number of ducts on either side of the veru montanum, or caput gallinaginis. (Below, the floor of the prostate urethre is full of pockets, which catch the instruments, therefore hug the sides of the urethra.)

What is the pathology of hypertrophied prostate?

It is a simple hypertrophy of that organ and occurs in many men, (one-third) after the age of 40-45. It is a fibromatous enlargement, not affecting the glandular structures or secretory portions. The enlargement may be regular or unilateral, or it may be irregular or atypical; lastly, enlargement of the middle lobe producing a little teat acting as a valve, and shutting off the stream. This is also known as the collar involvement.

What are the results of hypertrophy of the prostate?

Great enlargement may not cause much trouble, while little enlargement may greatly interfere. Enlarging backwards it encroaches on the bladder, lengthening the urethra. The results themselves are obstruction of the urethra, with retention of urine and decomposition; catarrh; eccentric hypertrophy or sacculation of the bladder.

Mention the symptoms of hypertrophy of the prostate.

History—(Passed 50 years of age.)

Frequency of urination—Passes water oftener at night. It may pull the involuntary sphincter out of place. This explains increased frequency of urination at night. You will get atony of the bladder wall with inability to throw the stream well, which often drops down directly, wetting the shoes. There is no blood or pain unless cystitis is present. We are likely to have catarrh from the use of dirty instruments, with infection of the ureters, pelvis and kidneys (urethritis, pyelo-nephritis, uraemia or sepsis).

How would you examine a patient with a hypertrophy of the prostate?

With the finger in the rectum; or, you may make him pass water and catherterize. This has two purposes. First, to see how long the urethra is, and, secondly, for the detection of residual urine, which is noted in its amount and collected.

Describe the treatment for hypertrophied prostate.

Indications are: (a) Disturbance at night if more than twice. (b) If over two ounces residual urine. (c) Catarrh of the bladder.

Prophylatic treatment. Avoid exposure on damp days. Patient should not sit on cold stones, avoid fatigue, jolting or long or rough rides. Use an easily assimilated well selected diet, to prevent congestion. Avoid alcohol and opiates, laxatives will be good. For this a spoonful of bran before breakfast, well masticated, is an excellent thing. Flowers of sulphur, in the evening. Enemeta. Stream of water against the perineum, urinate at stated periods. Local treatment. Catheter must be sterile. Teach him to use the catheter once for every four ounces of residual urine. Catheterize at bed time and allow no water at bed time. Permangate of potash, boric acid, or Thirrsch solution or a very dilute solution of silver nitrate; massage or electrolysis. Finally the operative treatment.

Name a few of the operative measures for hypertrophy of the prostate.

There are chiefly two operations. The supra pubic and perineal. The best is a combination of the two. The middle lobe is best operated upon from above. The same is true of isolated fibrous growths. For the lateral halves the perineal section is better. A "V"-shaped piece is taken out.

By what means do we produce atrophy of the prostate?

By castration or vasectomy. Castration, on account of its mental effects, gives bad results. Vasectomy, consisting in a ligation of the vas-deferens, gives much better results.

Name the varieties of prostatitis.

Follicular and parenchymatous.

The follicular may again be divided into acute and chronic. The acute is most always from gonorrhoea, or gonorrhoea with instrumentation, or the result of cold (old men with strictures).

Give the symptoms of prostatitis.

Pain and pressure in the perineum, down the thigh; heat and swelling in the rectum; prostate is enlarged and tender. May have a chill. When much swelling, retention results. Frequent urination and pain in the penis at the end of the act. Termination may be in resolution, production of a chronic condition, formation of abscesses, which are apt to be multiple and small and tend to open into the urethra.

Describe the treatment for acute follicular prostatitis.

Rest in bed with heat to the perineum, or hot enemata in the rectum. Sitz baths. Alkaline drinks. Lighter diet. When due to gonorrhoea, injections and soundings must stop. Remedies. Pulsatilla, belladonna, hepar, terebinth. Opium and belladonna suppositories may be given to relieve at night.

Give symptoms and cause of chronic follicular prostatitis.

It is usually the reminder of an old gororrhoea, with a stricture of large calibre. Symptoms are the same as in the acute form, but less in degree. Patient cannot hold the urine. Weight, fullness and irritation in the perineum, worse from stool; tenesmus in the rectum. Force of

stream diminished. Use the two-glass test, showing the hyaline casts from the prostatic follicles. Sexual irritation easily excited. Nocturnal emissions. Ejaculations are too early. Hemorrhoids are often present from straining.

What treatment is indicated for chronic follicular prostatitis?

Liquid diet. Treat the stricture, remove phymosis and a contracted meatus. Avoid meats and alcohol. Exercise is good, a bicycle is good, provided a saddle is used that does not touch the perineum. Nitrate of silver introduced through a Keye's catheter 1 per cent. solution (5 grains to the ounce), or you can use a 5 per cent. solution. Cold sounds, which have two tubes inside, through which allow cold water to flow.

Give causes, symptoms and treatment for parenchymatous prostatitis.

Usually traumatism. Symptoms similar to acute follicular prostatitis. Sepsis and the rapid formation of pus result. Heat, throbbing, pain and swelling in the rectum. Abscess may rupture into the urethra and the rectum. The treatment consists in preventing the rupture into the rectum or urethra by a perineal opening to attack the prostate from within the urethra, or oftener between the urethra and the rectum.

What are the symptoms of tubercular prostatitis?

It is usually secondary to general tuberculosis, or that of testicle or bladder. Once in a while it is primary. It occurs in young adults who have had gonorrhea. Symptoms are the same as stone in the bladder. May find epithelium and pus and the tubercle bacilli.

Give the treatment for tubercular prostatitis?

Not satisfactory. General treatment and the instillation of antitubercular remedies. If the symptoms are intolerable, an epicystotomy is done. Sometimes curettment is done and probably cures. A New York surgeon removed one-half of the bladder in a young individual for this trouble.

What malignant diseases of the prostate do we occasionally meet?

Sarcoma occurring in the young (15 per cent.), carcinoma (85 per cent.) occurring in old age.

Give the symptoms and treatment for malignant diseases of the prostate.

Agonizing pain; cystitis, which becomes putrid; metastases and hypertrophy of the glands; haematuria; pyuria. The treatment is not satisfactory. Make the patient comfortable and drain by a supra-pubic cut. Radicle is questionable. Combined prostatectomy.

How do wounds of the prostate occur and why are they important?

Wounds of the prostate are rare and usually occur in lithotomy operations. They are important because of (a) sepsis, (b) opening of the posterion capsule, permitting of extravasation and peritonitis.

Give a general idea of the formation of prostatic calculi.

They are liable to result from inspissated secretions which become coated with phosphatic deposits. These are (a) usually numerous, and at first lie in separate cavities; but (b) by breaking down the septa and becoming glued together with mucous and fibrinous exudates they fill the whole prostate as one stone; or (c) sometimes a vesical stone or a fragment sinks into the prostate and becomes encysted, a portion projecting into the urethra.

What are the symptoms of prostatic calculi?

They are hard to differentiate from vesical stones. The stone may be felt, or before the urine flow or the bladder is reached. The calculus

is fixed and is immovable on motion of the patient, or on palpation. They can be felt between a finger in the rectum and a sound in the urethra; or, if multiple, the friction between the stones may be noticed.

What is the treatment for prostatic calculi?

Occasionally they may be extracted by the urethral forceps or pushed into the bladder. Perineal lithotomy is usually employed. Watch for sepsis or infiltration of urine.

SURGERY OF THE URETHRA.

Give surgical anatomy of the urethra.

The urethra is not a tube, since its opposing walls are approximated except during urination, and in the male during seminal emissions. The length is about nine inches in the male, and it is divided into three parts: Prostatic, membranous, penine or spongy portion. The calibre is not uniform, since it is broadest at the bulb. Narrow points are the membranous urethra, just posterior to the fossa navicularis, and at the meatus. Surgically we have only two divisions, anterior and posterior urethra. The anterior is in front of the triangular ligament, the posterior is behind and including the triangular ligament.

Give a few important points about passing a sound or catheter.

The sound and urinary tract should be rendered aseptic. After you pass the fossa, hug the roof. Use no force. Put the finger upon the perineum as a guide, and keep in the middle line.

What are the ill effects of catheterism?

Urethral fever produced usually by the introduction of instruments into the deep urethra. Infection from dirty instruments; kidney disease.

Mention varieties of urethral fever.

When there is a little shiver, it is light in degree. In this condition they faint. Put patient on his back with head low. Next step is death. Suppression is common. There is chill, fever and sweat, and twenty-four hours may end the scene. Sometimes there are recurrences. Not so severe and more malarial; or it may assume a typhoid state at once. Especially is this found in old men who start to pass a catheter for a lifetime.

Describe the treatment for urethral fever.

Do not enter the deep urethra in a new case unless you must. Irrigate; let him lie down; must be placed in bed, with no exposure. Give aconite. For continued fever, gelsemium and baptisia. During the fever wrap up in blankets; give stimulants. If there is kidney trouble it must be relieved by sweating, hot-water bottles, etc. May infuse. Avoid congestion. Remedies for renal congestion: Arsenite of copper, cantharis, etc. Remove the cause, and when you must keep up, wash out the bladder.

What other complications may result from sounding?

(a) Urethritis, (b) prostatitis, (c) epididymitis, and (d) cystitis, or we may even have (e) synovitis and (f) iritis; (g) the urethra may be lacerated, causing haemorrhages and false passages. These are usually located in the bulbo-membranous junction, or at the stricture, the instrument being pushed under the urethra into the rectum or over the pubes.

Describe the treatment for haemorrhage of the urethra.

Lay the penis on the abdomen, with a piece of cotton under and a piece over it. Compress with a T bandage. Sometimes splints made of cigar boxes are applied. Splints should be applied according to the direction of the slit of the urethra. Make pressure against the perineum.

How would you treat a false passage, the result of bad catheterization?

See that the patient urinates, and if the bladder is not distended above the pubis, you may leave it alone. If he cannot urinate, you can tap supra-pubicly. Later you must do a perineal section. If this is impossible, an epicystotomy with retrograde catheterization must be done.

Where does rupture of the urethra most frequently occur? Give cause.

Membranous urethra. Cause: Falling astride of something. Instrumentation, coition, blows, etc. It might follow stricture. We may have (a) hemorrhage from meatus, which may be fatal, and the formation of a haematoma. (b) Worst feature is the extravasation of urine, which produces sloughing. (1) If in the penile urethra there will be swelling from the scrotum to the end of the penis. More dangerous is that occurring behind. (2) If in front of the triangular ligament, first there will be swelling of the perineum, scrotum and whole penis; and then it spreads to the abdomen. (3) If between the layers of the triangular ligament, it must slough through, and septic symptoms result. (4) If behind the posterior layer of the triangular ligament, the swelling may appear near the anus or the urine may spread into the pelvic tissues or peritoneum. If let alone the whole thing will slough and the bottom break out. In the ligament, it must first ulcerate through in order to get out.

Give the treatment for a ruptured urethra.

If you suspect it pass a catheter to see if it is impervious. If you get the catheter in, tie it and drain. If you cannot pass the catheter better do a perineal section at once. If there is still retention, do an epicystotomy with retrograde catheterization. Wounds when longitudinal tend to heal spontaneously; if transverse, they separate, and must be sutured. In front of the scrotum urethral wounds will not heal; behind the scrotum they will heal. In extravasation of urine, incision at once becomes necessary. Gangrenous spots may appear, but are not necessarily fatal.

Give causes and classification of urethral fistulae.

Causes are abscesses, ruptures, strictures or wounds. There are three classes, viz., in front of the scrotum (penile); behind the scrotum (perineal), and those of the rectum, (a) simple, or (b) indurated, (c) tortuous, (d) with loss of substance.

What is the prognosis of urethral fistulae?

It depends upon the amount of urine that comes out through the fistula, in comparison to that amount discharged through the meatus. If most of it comes through the urethra, it is good. If more than half through the fistula, it is bad.

How would you treat a urethral fistula?

Remove the stricture in front of the fistula. For perineal fistula, perineal section is best done. In anterior fistula, you may sew up if the perineum is open. The opening may be catheterized. If there is loss of substance, ingenuity must be used to restore the mucous membrane. The best place to get it is the inner side of the prepuce. Then take two flaps of skin from the thigh. The urethro-rectal fistulae are disgusting; we may have to use knee chest position, or the use of the catheter may be necessary every time he urinates. If this fails you must use rectal mucous membrane, which is drawn down over the fistula.

What foreign bodies are found in the urethra and how are they diagnosed?

Calculi, pieces of instruments, almost anything, even a hair pin. They are usually found behind a stricture, or at a normal narrowing. Diagnosis is made by finding an interference with the urinary stream.

Localized pain and tenderness. Usually we can recognize the foreign body by touch. We find foreign bodies especially in children.

Describe the treatment for foreign bodies in the urethra.

(a) Remove through the meatus with urethral forceps. At times it will be necessary to divide the stricture first. (b) Another method is to push the foreign body back into the bladder by means of a sound. Relieve the urgent symptoms and treat as a foreign body in the bladder. (c) Incise over the body, remembering that in order to have it heal you must incise behind the scrotum; therefore, push the body back. If you must sew up in front of the bladder, introduce and tie a catheter into urethra.

Mention some anomalies in the urethra.

In the newborn we find congenital defects of development. These are of varying degree; if simply a veil, you must incise. If there is any external cut through the perineum; do a plastic operation later. Occasionally we find urethral pouches; these are produced by stone. They should heal by granulation. Must simply milk out, but must be sure that there is no stricture in front. If there is gleet and pus, you must reduce the pouch by a plastic operation.

Give a definition for urethral stricture.

It is an abnormal narrowing of the urethra, or a lack of dilatability, or distensibility of the urethral canal, involving the mucous, submucous and muscular coats.

How many varieties of urethral stricture are there ?

Three—Spasmodic, inflammatory, organic.

What is a spasmodic stricture?

If it does exist it is due to muscular contraction, which is irregular and due to direct irritation; or, oftener, to reflex irritation, the result of stricture in front. Usually found at the anterior leaflet of the triangular ligament.

What treatment should be used for spasmodic stricture?

Hot baths and anodynes to relax the stricture. If this is not successful, dilate with large sound.

What is an inflammatory stricture?

It is a rare variety and is usually due to an inflammatory swelling in the anterior or posterior urethra. It does not often cause retention of urine.

How are inflammatory strictures treated?

Relaxation and soothing. Give quantities of diluent drinks. The object of this is to make the urine less irritating and give it more expulsive power. Hot baths and anodynes are necessary. If there is acute distention, careful catheterization will relieve. Other operations may be resorted to.

Give the causes and pathology of organic strictures.

Injuries, rough instrumentation, laceration; and the commonest, acute specific urethritis, long continued and severe. An organic stricture results from an abrasion of the mucous membrane. Following this, we have the formation of connective tissue, which contracts, forming a stricture.

Where are strictures located according to their causes?

Traumatic strictures usually in the membranous urethra. Gonorrhoeal at different places, especially where the disease is worst. This is frequently at the fossa navicularis, or two or three inches down in the canal, and at the bulbo-membranous junction.

What are the varieties of organic stricture?

(a) Linear, (b) annular, (c) tortuous, etc. According to location—(1) Meatal; (2) superficial, when not deeper than 4 to 4½ inches. These cannot be divided behind the scrotum. (3) Deep strictures, located deeper than 4—4½ inches. Another classification is (a) irritable, (b) resilient, (c) hard, (d) soft. There are also strictures of (1) large and (2) small calibre, the number 15 French dividing them (below 15 French, small; above, large). (3) Then we have tight strictures, which will admit a filliform, and (4) impassible strictures, which are imperviable to any instrument.

What is the capacity of the urethra?

Measure the circumference of the flaccid penis. If two inches take a number 20 French sound; if 2½, a 25 French; 3, 30, etc. Every quarter inch difference in circumference calls for a difference of two numbers in the size of the sound.

How are strictures diagnosed?

By the obstruction to the passage of an instrument, which should easily pass through the urethra.

What are the symptoms of stricture of the urethra?

Increased friction and resistance irritating the bladder and causing frequent urination; imperfect closure of the sphincter and weak expulsion, causing dribbling at the end of urination; increased friction and imperfect expulsion, with decomposition of the retained drops, irritating the mucosa and setting up catarrh. Irritation causes reflex pains (hypogastric and lumbar especially), sexual disturbances, etc.

Mention some of the results of urethral stricture.

Gleet; backtelling, causing inflammation; dilatation behind the stricture and ultimately retention.

Mention some methods for the treatment of urethral strictures.

(a) Gradual or intermittent dilatation, by means of straight or curved sounds. Have your sounds clean and do not go behind the triangular ligament.

(b) Divulsion, or a rapid dilatation, was recommended by Bigelow, of Boston, but should never be resorted to.

(c) Gradual divulsion, by means of Kohlmann's dilator. This may be useful at times.

(d) Permanent or inlying dilatation. This is only useful in filliform strictures. First put in one filliform, then another, etc. Never allow to remain in longer than four or five days.

(e) Galvanic current. An ordinary sound with a metallic tip, covered by galvanized rubber, is introduced to the seat of the stricture; and an electric current of four or five milliamperes is applied to it.

(f) Dilatation by means of Otis urethrometer.

(g) Internal urethrotomy.

(h) External urethrotomy.

Describe an internal urethrotomy.

First render the urethra aseptic. This operation can only be used for superficial strictures. There are two ways—From before backward, and from behind forward. In French these terms are known as d'avant en arriere and d'arriere en avant. When cutting from before backward in tight strictures, Maisonneuve is the instrument to be used. The operation from behind forward is known as the operation of Otis.

Describe an external urethrotomy.

This is done alone or combined with internal urethrotomy. The external urethrotomy should always be done for strictures behind the scrotum. There are two methods, viz.—(a) Operation of Syme, (b) perineal section. The operation of Syme consists in passing a guide (or staff)

into the urethra. Then cut down on the guide and divide the stricture completely. Cutting without a guide is perineal section, and this can be done in two ways—(a) Operation of Wheelhouse, (b) operation of Cock. In the operation of Wheelhouse a staff is passed down to the stricture and perineum cut through. Open the urethra in front of the stricture and try and find the opening by means of a probe, or groove director. In the Cock operation, which should only be used in the impassable strictures, the stricture is entirely disregarded. The knife is pushed into the urethra behind the stricture. This is only used in rare cases. If you cannot get through the urethra do a perineal section or an epicystotomy.

What is a meatal stricture and how are they treated?

It is a stricture located not deeper than the posterior border of the fossa navicularis. The treatment consists in a meatotomy. The incision is made in the median line to either side to avoid the frenum.

Give treatment for strictures of large calibre.

(a) If less than four inches deep, use gradual dilatation, or dilate with Kohlmann's dilator. For hard and irritable strictures do the operation of Otis. (b) When the stricture is deep it should be treated by careful sounding. If this is not enough, use the curved dilator of Kohlmann. If this is not successful, do an external urethrotomy of Syme.

Give the treatment for strictures of small calibre.

(a) When superficial do the same as for those of large calibre. If they allow a filiform, then the inlying method is applicable. Use dilators or cut with the Maisonneuve. (b) Deep strictures of small calibre; always external urethrotomy, or perineal section, either by method of Wheelhouse or Cock.

Give the treatment for impassable urethral strictures.

Perineal section (Wheelhouse) or Cock's operation and retrograde catheterization; or, sometimes, epicystotomy and retrograde catheterization.

SURGERY OF THE PENIS.

What are the two principal malformations of the penis?

Hypospadius and Epispadius.

What is hypospadius and give its varieties?

It is an absence of the floor of the urethra. The varieties are balanitic or glandular, penile, (from one inch to scrotum associated with downward curvature of the penis); scroto-perineal (fissure of scrotum resembling female genitalia and an atrophic and bound down penis); perineal variety.

What is the treatment for hypospadius?

It is an operation done in several tempos. First divide the constriction in order to straighten the penis. Then make a new meatus by the method of Dupley. The wound can be protected by bringing the foreskin around. Then the defect must be closed, which may be done in several ways. Catheter is passed into the bladder and skin flaps are overlapped from either side.

What is epispadius and give its treatment?

It is a very rare condition usually found in connection with an absence of the roof of the urethra and extrophy of the bladder. The treatment consists in a plastic operation; either the method of Dupley or Thiersch.

How would you diagnose an epithelioma of the penis?

There is usually a history of irritation of the penis, or a phymosis. It usually begins in the form of a wart; then it becomes a foul ulcer, which, later, discharges a watery fluid, foul in nature. There is rapid infiltration of the penis and metastases to the groins. Excise a part of it and examine it under the microscope.

How would you treat an epithelioma of the penis?

As soon as the diagnosis is made, amputation must be resorted to, which should always be made behind the diseased portion. The amputation of the penis may be partial or complete. In a partial amputation, leave the spongy portion, containing the urethra, longer than the cavernous portion. Slit the urethra and stitch it to the skin. A complete operation may be done in two ways. Best: Split the scrotum; turn the testicles to either side; divide the spongy portion with the urethra, and stitch the latter to the skin of the perineum, which becomes thus a permanent meatus.

Name some other conditions which are occasionally met with in the penis.

Phimosis, paraphymosis, ballinitis. herpes progenitalis, condylomata (acuminata and lata), lymphangitis and lymphadenitis. Atheromatous cysts. Fractures and dislocations of the penis occur rarely and are usually followed by bad curvatures. The chief treatment for these fractures is the arresting of the haemorrhage by cold, pressure, incision, etc.

Mention some of the anomalies of the penis.

The penis may be entirely absent or concealed, which is quite rare. It may be small, double, twisted or adherent. Adherent penis demands our attention, as it interferes with copulation.

What are the abnormalities of the prepuce.

It may be absent, or it may be adherent or phimotic.

What are the treatments for these conditions?

Absence of the prepuce requires no treatment. Adherent prepuce is a bad condition, giving rise to some local and many reflex symptoms. It is found in a large number of boys at birth.

Treatment:—This should be instituted at once. The prepuce should be stripped back, the glans and parts behind it cleansed and strict cleanliness kept up. If it has become markedly phimotic, circumcision becomes necessary.

Describe the operation of circumcision.

Children should be given a general anaesthetic. In adults a 10 or a 4 per cent. solution of cocaine may be used after the penis has been constricted at its root. After thoroughly cleansing the parts, draw the prepuce forward by two clips applied to it on either side of the glans, and with scissors amputate the prepuce just in front of the glans. After retraction, cut the mucous membrane in the median line, breaking up any adhesions between prepuce and the glans with a probe. After removing the constriction and ligating or twisting any spurting arteries, dress with iodoform and gauze or bichloride of mercury dressings. Unite the skin and mucous membrane with interrupted catgut sutures.

What complications may arise from circumcision, and how are they treated when found?

Inflammation and oedema from rough handling, infection of pus, loss of erectile power, recurrence of phimosis.

Inflammation and oedema can be treated by the indicated remedy,

arnica, etc.. When there is pus infection take all the stitches out and thoroughly cleanse.

What is paraphimosis, and what is the treatment?

It is a condition in which the prepuce is tightly constricted behind the corona glandis, causing inflammation, marked pain, rise in temperature, etc. The glans is entirely exposed. The condition is usually due to traumatism.

Treatment:—If irreducible by manipulation (the fingers holding the prepuce and the thumbs forcing the glans back) multiple incisions or a cut along the back of the penis may be made.

SURGERY OF THE SCROTUM.

Name some affections of the scrotum.

(a) The scrotum is made up of loosely arranged connective tissue, which allows oedema and infection to spread rapidly. (b) Dropsical swellings of the scrotum are usually due to cardiac disease. (c) Eczema or the continued use of bichloride solutions may cause a swelling with mild inflammation. Extravasation of urine often causes severe swelling. (d) Epithelioma of the scrotum is a common occurrence and is commonly known as "chimney sweep cancer." Such an epithelioma is the result of constant irritation from soot and the lack of cleanliness. It begins as a little wart, changing to an ulcer, which attaches itself deeper and deeper. The inguinal glands are frequently involved. The treatment consists in early extirpation, and is usually followed by very gratifying results. Elephantiasis Araba is very rarely met in this country. There is enormous hypertrophy of the skin and subcutaneous tissue, often associated with recurring inflammation and lymphatic obstructions.

What is ectopia of the testicle?

It is a condition in which the testicle is not in its normal place. The testicles in early foetal life are near the kidneys, and are drawn down into the scrotum by the gubernaculum testis. When only one testicle descends, the other remaining in its foetal position, we call it "monorchidism." If both testicles are absent it is known as "cryptorchidism." When the testicles remain in the inguinal canal we have a condition known as ectopia testis.

What becomes of a non-descending testicle?

They usually atrophy and are functionless; besides, they are apt to give rise to malignant growths. When operating for hernia and the surgeon meets with an undescended testicle he should either try and pull it down into the scrotum, which can at times be done by loosening the epididymis, and so prolong the vas deferens, or when this is not possible remove the testicle, which is only a functionless organ.

Give the symptoms and treatment of an epididymitis.

This condition is far more common than orchitis. It is found especially in the left testicle, and results from gonorrhoea, cold, deep instrumentation or operation or tuberculosis. Pain and tenderness in the cord, worse in the epididymis, heat, swelling and a sick feeling from a dragging up to the groin and back are the chief symptoms. A double epididymitis usually results in impotence. The treatment consists in rest, elevation of the scrotum and the internal administration of pulsatilla; later iodine and iodide of potassium. Locally we may apply several layers of cotton, which should be left on for one week. It may be complicated by an acute hydrocele.

Prognosis:—Impotentia fecundandi.

What are the varieties of orchitis?
Acute, chronic, tubercular.

Give symptoms, causes and treatment for acute orchitis.
The acute variety is always due to traumatism, kicks, blows, or to metastasis (mumps), but never to gonorrhoea. The symptoms are the same as in epididymitis, with pain and increase in size. It may go on to chronic orchitis or develop into suppuration and infection, or result in atrophy of the testicle. The treatment is the same as that for epididymitis. When pus forms, incise and empty the pus.

What is the cause of chronic orchitis?
It may come from an acute attack, or be syphilitic. Syphilitic chronic orchitis is painless. It involves both testicles. There is a uniform enlargement and the history of a primary sore. A syphilitic testicle is usually heavy, hard, irregular and nodulated. It yields readily to antisyphilitic treatment.

What is tubercular orchitis and how is it treated?
It is a tubercular inflammation of the testicle, secondary usually to epididymitis. It is chronic in its course and found between the ages of 20—40. The disease usually begins with a little nodule in the epididymis, with some pain and tenderness; gradually the nodule increases in size and caseates through the skin. The treatment is medicinal and generally hygienic. Keep the caseous foci clean, and when one of them suppurates, curette. Castration should not be resorted to unless the testicle and epididymis, as well as the vas deferens, are diseased.

What tumors are found in the testicle?
In the young we are apt to have a sarcoma. In older ones, carcinoma are also occasionally seen. The enchrondromata of the testicle, although counted benign, often become sarcomatous, and therefore malignant. These tumors resemble orchitis and later an old hydrocele. They are slow in growth, but progressive, and do not show signs of acute inflammation. Pain is considerable in such tumors, with a tendency to increase, and enlargement of the cord and glands (lumbar). There is a tendency to attachment to the skin and to the formation of metastases.

Describe the treatment for tumors of the testicle.
When the growth is of a suspicious character, try first the absorptive treatment by means of dry poultices. If in two or three weeks this does not show marked improvement, make an exploratory incision, and if the growth proves malignant remove the testicle.

Describe castration.
An incision is made in the scrotum, the vas deferens and its vessels ligated, the testicle removed and the wound sutured and packed. Some surgeons simply ligate all the vessles of the vas deferens and so cause an atrophy of the testicle and prostate. This is known as vasectomy.

What is a hydrocele?
It is an abnormal accumulation of fluid in the tunica vaginalis testis or peritoneal pouch, anywhere from the internal ring to the bottom of the testicle. It usually occurs on one side only, but may occur on either.

Name the varieties of hydrocele.
(a) Congenital hydrocele results from a non-closure of the sac, the fluid trickling down.
(b) Diffused hydrocele is between the scrotum (bottom) and the internal ring.
(c) Encysted hydrocele is a collection of fluid in a cavity formed by adhesions between the epididymis and the tunica vaginalis, or between

the tunica albuginea and the tunica vaginalis. It usually follows operations.

Give a few characteristics of hydrocele.

They develop from below upward and are not associated with cough impulse. They are pear-shaped and they fluctuate and are tense. Percussion elicits dullness, and no inflammatory symptoms. The chief symptom is translucency.

What is the treatment for hydrocele?

It may be palliative or radical. The palliative treatment is as follows: Locate the testicle so as not to injure it, then using a large hypodermic syringe, draw off some fluid and inject four to six drams of iodine. This is exceedingly painful. We may inject a few drops of crude carbolic acid or some bichloride of mercury (1 to 1000-2000).

Describe the radical treatment of hydrocele.

There are two methods. (a) Volkmann. (b) Bergmann.

Volkmann incises, evacuates the fluid, and cuts a piece of the sac off and stitches the ends of the sac to the skin. By means of careful packing he allows granulations to take place from above down.

Bergmann differs in that he removes or destroys the sac by scarification of the entire sac.

What is an haematocele?

It is an acute or chronic blood effusion into the tunica vaginalis, the substance of the testicle, the epididymis, or the spermatic cord. It is usually caused by traumatism, muscular violence, or it results secondarily to diseases of the epididymis and testicle.

Give the symptoms and treatment.

The symptoms are pronounced and immediate in the acute variety. There is a slightly painful, pyriform, non-translucent tumor, giving at first thrill and fluctuation and attended with scrotal ecchymosis. When of slow formation there is a painless, hard, ovoid or pyriform tumor, showing at times spots of softening.

Treatment—Arrest the haemorrhage, reduce the inflammation and aid absorption by pressure. Incision followed by packing is also resorted to.

What is a varicocele?

It is a dilatation of the veins of the pampiniform plexus and of the sparmatic cord, either those lying anterior to the cord and accompanying the spermatic artery, or the smaller set accompanying the deferential artery and the spermatic cord.

At what period of life does it most frequently occur?

Soon after puberty.

What is the cause of varicocele?

Unnatural sexual gratification. Most frequently found in men whose minds almost constantly dwell on sexual ideas.

On what side does varicocele most frequently occur and why?

Usually on the left side. There are two reasons:

(a) The left spermatic vein empties at a right angle into the renal vein. Congestion can therefore take place.

(b) In constipated individuals, the distended sigmoid flexure is very liable to press upon the left spermatic vein, causing overdistention of the latter.

What are the subjective sensations of a varicocele?

As the varicocele is usually slow in its development, the symptoms are very gradual in onset. There may be dull pain, aggravated by exer-

cise and during intercourse. The mental symptoms are as a rule more pronounced and are usually the symptoms for which the operation is done.

What are the subjective symptoms of vericocele?

The veins feel like earth worms. If the patient lies in the recumbent position, the veins empty themselves and the feeling of earth worms disappears, but as soon as the patient assumes the standing posture the dilated veins reappear. There is atrophy of the testicle, pseudo-impotence and sexual hypochondriasis.

What are the most important symptoms calling for an operation?

(a) Hypochondriasis of patient.

(b) Pain in the testicle and groin, interfering with patient's occupation and comfort.

(c) Wasting of the testicle.

What operations are done for varicocele?

(a) Ligation or subcutaneous method. (b) Excision method.

Describe the ligation or subcutaneous method.

After the patient is prepared in the usual way, separate by means of the touch the spermatic cord from the distended veins. Then introduce a stitch through the scrotum, the distended veins anteriorly, the spermatic cord posteriorly, return the suture anterior to the veins through the initial opening and tie. Ligate above and below.

Describe the excision method.

Make a longitudinal incision into tne scrotum, just above the varicose veins, ligate the latter, excise them, and transform the longitudinal incision into a transverse wound, so that the scrotum is shortened and serves as a suspender.

SURGICAL DISEASES AND INJURIES OF THE CHEST.

What is hydrothorax and give its causes?

It is a serous effusion into the pleurae. Its causes are acute and chronic lung or pleural inflammation, tumors (passive), foreign bodies. The usual cause is acute pleurisy with effusion.

What are the symptoms and treatment of fluid in the pleural cavity?

The same as those of any fluid, and in addition to these we find the patient lying on the affected side. There is limited motion, bulging or obliteration of the intercostal spaces, and displacement of the adjacent organs, e. g. the apex of the heart is displaced. There are no friction sounds, fremitus is gone. There may possibly be oedema of the chest walls resulting in pus formation, worse on the affected side; dullness with variable level; the usual signs of compressed lung.

Treatment—Tapping, viz. paracentesis. (See below).

What is pyothorax and what are its causes?

It is an emphysema or pus in the pleural cavity. The causes are the same as those of serum effusion with contamination from the lung circulation, or as the result of an operation, or from traumatism, e. g. (1) From idiopathic causes, (a) staphylococci or streptococci (pyogenic). (b) diploccocci (Fruenkel's pneumococci in pleuro-pneumonia), (c) tubercle bacilli, (d) saprophytic bacteria, (causing the putrid form). (2) Traumatic infection in the simple and mixed forms from burns, wounds, foreign bodies, etc.

Describe the course of pyothorax and give the symptoms, prognosis and treatment.

In acute cases the pleurae remain thin, but in chronic cases they become thick and leathery. The pus may become encysted or end in caseation, or it will increase rapidly until, filling the pleural cavity, it finds vent, either into the lungs, or by burrowing along the intercostal spaces in the back; or it may exit in the form of a submammary abscess. It may rupture into the anterior mediastinum, or through the diaphragm in front of the peritoneum, or it may be found in the pelvis or forming a psoas abscess.

The symptoms are serous effusion plus pus symptoms, fever, sweat, emaciation, hectic chills, etc.

The prognosis is good in most children, but bad in adults, being nearly always fatal.

The treatment consists in tapping, which is described below, or in incision, and excision and resection of a portion of the chest wall.

What is haemàtothorax, and what are the causes producing this condition?

It is blood in the pleural sac. It is usually caused by traumatism, e. g. contusions, fractured ribs and wounds, especially gunshot wounds.

In what does the treatment for haematothorax consist?

In arresting the haemorrhage. This may be difficult of accomplishment and depends on the location. The worst haemorrhages are those from the intercostal and internal mammary arteries. Bleeding may be controlled by the umbrella pack; if not, bite away the wound and ligate the vessels.

What are the indications for operative interference in pleuritic affections?

The case should be operated. 1. If there is a great amount of fluid. 2. If the serous fluid does not absorb. 3. If there is perforation into the lung (causing great distress). 4. If there are symptoms of sepsis and pus. 5. If there is continued haemorrhage.

What is paracentesis?

It is the evacuation of a cavity by tapping. An aspirator may be used and the fluid sucked out. Performed on the chest, it is known as paracentesis thoracis, or thoracentesis; when on the abdomen, as paracentesis abdominis. In tapping, the use of the aspirator prevents infection and the entrance of air into the cavity (after the withdrawal of the instrument) by first pushing the instrument through the skin and dragging the skin up for about an inch, and then pushing the instrument through the muscle into the chest. After withdrawal the skin retracts, practically closing the opening in the chest wall. Thoracentesis is best done in the axillary line at the seventh or eighth interspace, hugging the top of the rib to avoid the vessels. Draw the fluid off slowly, stopping on any indication of fainting.

Pyothorax due to the pneumococcus is usually cured. Prognosis is less favorable when the affection is due to the streptococcus, and least so when due to the bacilli tuberculosis, though the operation should be performed for the sake of cure as well as for diagnostic reasons.

What is thoracotomy?

It is the making of a free incision into the chest wall. It is done at the same point as thoracentesis. To insure a valve-like opening, the skin is drawn upward and a two-inch incision is made along the intercostal space; the skin being allowed to retract when the operation is completed.

Describe the resection of a rib, or thoracoplasty.

Bare the rib by a longitudinal incision, bite out a section with Ron-

guer forceps and introduce a tube. Some operators leave the periosteum in, but this is unnecessary.

Describe Estlander's and Shede's operations.

Estlander's operation is a multiple resection of the ribs and is used especially in cases of collapsed lung. By the resections, the chest wall is brought nearer the lung. The operation consists in making transverse cuts along the centre of each intercostal space with the removal of the upper and lower ribs in the wound.

Shede has suggested an operation as follows: The resection of all the tissues of the wall and the approximation of the skin and superficial fascia to the pleura. It is a modification of Estlander's operation.

Give the indications for operations on the lungs.

Operation is indicated in (a) gangrene, (b) abscesses, (c) foreign bodies, (d) to remove tumors or drain cysts, (e) tuberculosis, (f) wounds of the lung.

Define pneumotomy and pneumectomy.

Pneumotomy is an incision while pneumectomy is an excision of the lung.

When is pneumotomy indicated?

In gangrene when accessible, or when necessary to drain the lungs, as in abscesses or cysts or when foreign bodies are present.

Describe pneumectomy and give the indications for it.

It is applicable for herniae of the lung, the protruded portions being either tied or burned off and the part drained.

What is the treatment for intrathoracic tumors or cysts?

They are hard to recognize. They may spring from the chest walls or from contained organs; the former being sometimes operable, the latter never. Cysts may be drained. Ribs may be resected, the sternum removed, or the growths may be attacked from behind.

Give the causes, symptoms and treatment of contusions of the chest wall.

They may result from crushes, blows, etc. The symptoms are soreness, pain which is worse on coughing, sneezing, etc., abdominal breathing; the patient lies on the affected side or back.

Treatment—This consists in rest, bodily and of the chest. When haemorrhage is present, cut down and control the bleeding by packing or ligation.

What can be said of contusions of the thoracic viscera?

Such contusions are often deceptive. Effusion of blood or air occurs with a consequent haemoptysis or emphysema, etc. If emphysema occurs, nothing need be done. If the air is just beneath the skin, a prick with a knife will suffice to let it out.

Mention the varieties of chest wounds, tell which is the more dangerous and give the symptoms and treatment.

Chest wounds may be any one of the penetrating or non-penetrating varieties. The penetrating are the more dangerous, as they produce haemorrhage and sepsis. The symptoms are haemoptysis, external bleeding, signs of lung collapse, fluid in the pleurae, emphysema and possibly hernia of the lung.

Treatment—Arrest haemorrhage, ligating the intercostal and internal mammary arteries if necessary; cleanse and occlude the wound. Avoid useless probing. When a pneumocele occurs, cleanse and reduce. If impossible to reduce, excise. In emphysema, if the air constantly whistles out, burn the opening, stitch the lung and drain the cavity.

What is emphysema?

It is a condition arising from the escape of air from the pulmonary organs into the adjacent subcutaneous tissue. This causes a pneumothorax.

Give the symptoms and treatment of a retro-sternal or mediastinal abscess.

It may result from a traumatism or as a secondary effection, and is rarely idiopathic. There are such symptoms as weight in the sternal region, pain on suddenly moving the chest, shortness of breath, oedema and signs of pus.

Treatment—Trephine the sternum, curette and pack the abscess cavity.

SURGICAL DISEASES AND INJURIES OF THE DIAPHRAGM.

Of what do the congenital defects of the diaphragm consist?

They consist of fissures which permit the escape of the abdominal viscera into the thoracic cavity. The conditions is rapidly fatal, as strangulation soon occurs.

Give a description of other affections of the diaphragm and the treatment.

Paralysis of this muscle results from injury to the phrenic nerve. Rupture with a consequent hernia is caused by traumatism, muscular exertion or the bursting of a liver abcess.

Injuries are mostly the results of gunshots or stabs.

Tumors are exceeedingly rare and, owing to their slow growth, the symptoms are very obscure.

Treatment—Laparotomy is performed when the diagnosis is approximately certain.

SURGICAL DISEASES OF THE HEART.

What conditions of the heart call for the employment of surgical measures?

Over distention of the ventricles (as in acute pulmonary congestion) and effusion into the pericardial sac. This latter results from pericarditis, acute or chronic, and causes urgent symptoms.

Give the symptoms of pericardial effusion.

Precordial distress, dyspnoea, fainting, aphonia, weakening pulse, dysphagia, dilated veins in the neck, dulness, muffled heart sounds and a diminution of the apex beat.

What methods of treatment are employed in the above conditions?

Over distention calls for tapping or paracentesis auriculi. This is done at the third interspace on the right side of the sternum. Suction is then employed. Tapping is very dangerous and must be done quickly.

Pericardial effusion is also operated by tapping or paracentesis pericardii. This is performed at the fifth intercostal space, two inches to the left of the sternum.

SURGICAL DISEASES AND INJURIES OF THE NECK.

Name the fissures of the foetal neck.

They are the first, second, third and fourth branchial clefts. The first remains persistent as the Eustachian tube, the tympanic cavity and the auditory canal. The others close before birth normally.

What malformations result from the persistence of such clefts?

Cysts, sinuses and fistulae. The cysts result from a closure of the cleft at both ends and are due to activity of the lining membrane after puberty. These cysts may be mucous, serous, atheromatous or haemorrhagic, or sanguineous. They may be small or very large, are more frequent on the left side and fluctuate. The second and third clefts are usually located near the larnyx and the pharynx and are attached to the vessel sheaths, from wnich fact they often resemble aneurisms.

Describe these cysts.

Mucous—These occur as ranulae and cysts at the base of the tongue.

Atheromatous—These are lined with epithelial tissues which give rise to the contents, such as hair, bone, cartilage, cholestrine crystals, etc.

Serous—These occur as hydroceles of the neck. They have thin walls and may be single or multiple.

Sanguineous—These may have an endothelial lining and communicate with the anterior jugular vein.

What is the treatment of these cysts?

Serous cysts may be tapped, the cavity irrigated and packed with iodoform gauze. Atheromatous cysts should be removed by dissection.

Sinuses and pockets cause irritation when dirt or sebum accumulate in them and should be treated by cleanliness and should be curetted or cauterized so they may heal. The internal sinuses open into the pharynx, or externally into the neck, or both. They often have food forced into them which finally causes suppuration and deep seated abscesses. These should be opened from the exterior and a fistula formed. Fistulae from the pharynx should be curetted and cleansed or the edges should be freshened and sutured. Trachial fistulae occur in the median line.

Give a description and the causes and symptoms of cellulitis of the neck.

Cellulitis of the neck may be primary or secondary, superficial or deep, and vary in its effects according to the location as regards the layers of fascia involved and the extent of the spreading. It may produce dangerous pressure on the trachea and other structures or burrow to the mediastinum or axilla. Primary cellulitis may result from exanthemas, cold, injuries, wounds and blows. The secondary abscesses may come from wounds, carious teeth glands, necrosis of the jaw, or laryngeal cartilages.

The symptoms are the usual ones of abscess with brawny induration and oedema masking the fluctuation. One variety, Ludwig's angina, or infectious submaxillary angina, is a remarkably fatal gangrenous process characterized by dyspnoea, dysphagia and prostration from septicaemia.

How are such phlegmons of the neck treated?

Begin before suppuration commences. Hilton's operation is the best. It consists in making an incision through the skin and fascia with a blunt dissection until pus is found. By using an artery clip to open the cavity, the opening may be enlarged on the withdrawal by the separation of the handles. Thoroughly cleanse with peroxide of hydrogen, swab out with strong carbolic acid, irrigate and mop with bichloride of mercury and drain with gauze or use a bichloride of mercury poultice. Give constitutional remedies such as arsenic and its compounds, and place on a nourishing diet.

How may the depth of a wound of the throat be judged?

By the character of the blood (venous or arterial), by the escape of air by the discharge of food or mucus, by dyspnoea which is due to

injury of the trachea or the inhalation of food, mucus or blood; by dysphagia and by emphysema. The larynx and the trachea may be divided and the carotids escape because of the sterno-mastoid muscles.

What are the dangers of a cut throat?

Haemorrhage, air in the veins, sepsis which causes phlegmon, the swallowing of septic products which causes a pneumonia, septicaemia.

Describe the treatment for cut throat.

Arrest the haemorrhage promptly. Press with the fingers until a clip can be applied, cleanse and suture if possible. Air in the veins produces a gurgling sound, then pallor, dilatation of the pupils, tumultuous heart action and embarassed breathing, and is treated by pressure or ligature or the persistent use of resuscitation methods.

Tracheotomy may be performed for dyspnoea. It may be necessary to feed through a tube or per rectum until the wound is healed. Sometimes a suture of the trachea is indicated.

Prevent the renewal of suicidal attempts.

What conditions may be produced by contusions of the neck?

Contusion may cause dangerous swelling and pressure, paralysis, oedema or spasm of the glottis (tracheotomy), fracture of the hyoid or the laryngeal cartilages and emphysema (tracheotomy).

Give the treatment for the above conditions.

The condition of the respiration must be known, as tracheotomy may be indicated. Keep the patient quiet, enforce silence and use antiphlogistics internally or locally.

Name the varieties of tumors of the neck.

All kinds may be found here. They may be primary or secondary and the secondary may be benign or malignant. The commonest ones are the infective granulomata, which are tubercular and syphilitic. The tubercular variety were once called scrophula. They are usually extensive, possibly reaching from the ear to the clavicle. They are met with especially in children, and they are usually primary or they may result from irritation, e. g., eczema, teeth, etc.

Give the treatment for these tumors.

They may be operated early or late according to the indications, by enucleation or excision. The difficulty in doing either of these will very according to the location of the tumor. Guaiacol may be administered.

What glands of the neck are affected by secondary syphilis and what is the treatment?

The glandulae concatenatae, viz., those posterior to the sterno-mastoid muscles. They rarely suppurate.

Treatment—Mercury.

What is Hodgkin's disease and what is the treatment?

It is a progressive enlargement of the lymphatic glands with anaemia. The cervical glands are first affected and then the axillary, etc. It is also called malignant lymphomata, lympho-sarcoma, etc.

Treatment—If diagnosed early and but a single and accessible group of nodes is involved, the spleen apparently normal and the anaemia slight, a thorough removal of the mass is in order. This may not be a permanent barrier to the extension of the disease. When the disease has become general, operation is not to be thought of excepting to remove masses causing suffering or interference with the vital processes.

What can be said of lipomata of the neck?

They are tumors composed of fat and they may be encapsulated or diffuse. The lipomata usually found in the neck are the diffuse subcutaneous variety.

What are the causes, symptoms and treatment of salivary fistulae?

Salivary fistula is the condition in which the normal secretion of the gland escapes through an abnormal opening on the side of the face or neck. They are caused by a wound severing the duct, or by abcesses, ulceration or gangrene.

Treatment—Some are cured spontaneously. Where they persist, the best method is to pass a silver probe or wire through the duct from the mouth along the distal portion of the duct and on into the duct through its proximal end. Unite the cut ends around the probe with very fine catgut sutures, not entering the lumen; and close the face wound in the usual way. All methods fail in some cases.

Give causes and symptoms of suppurative parotiditis.

It is often secondary to acute parotiditis, or mumps, or is found in exanthemata and infectious diseases, e. g. erysipelas, pyaemia, and occasionally in adynamic fevers.

The symptoms are usually severe pain on account of the firm capsule. The pus may open into the auditory meatus, and occasionally down the neck into the chest, or into the space behind the pharynx.

Give the treatment for suppurative parotiditis.

The treatment consists in keeping the mouth disinfected and in early evacuation, care being taken, in so doing, not to injure the facial nerve and Steno's duct.

Where are salivary calculi found and how are they treated?

They are usually found in the salivary gland in the submental region, sometimes occupying the centre of the gland or the deep surface.

The treatment consists in dilating the duct or incising the gland from without, having first diagnosed its position with a probe.

What tumors are found in the parotid gland and how are they treated?

Carcinoma (forty-five per cent.), chondroma (thirty per cent.) and sarcoma with fibroma and cystoma are most frequently found. The tumors are usually mixed and secondary to similar growths on the face or in the pharynx.

Treatment—The growth should be removed by a dissection from below and behind, forward and upward, the external carotid having been ligated or clamped, and great care being exercised not to injure the facial nerve and other dangerous structures. When the deeper parts have been reached, the mouth may be opened to give a larger cavity in which to work. The dangerous structures are at the entrance and in front to the inner side of the head and neck of the condyle; more deeply, they are on the posterior wall. Some large tumors, if the adhesions are loose, are removed with little difficulty and little haemorrhage; but the removal of adherent tumors even of small size is fraught with much danger. In adherent tumors, a stump may be left if difficult of removal, and a secondary operation performed after it has grown more superficial, as is often the case if left.

What can be said of ranulae and sublingual cysts and their treatment?

Ranulae occur as cysts under the tongue and usually to one side of the fraenum, being often transparent and bluish in color, and having thin walls. They contain mucus, and though painless are annoying because in the way. They occur as outgrowths from the ducts or from obstructions and dilatation of the mucous follicles on the floor of the mouth.

Treatment—The cyst walls may be dissected out, or, if this is impossible, a larger section of the cyst wall should be cut out, the cavity

packed with gauze and a permanent opening obtained; or the cyst walls bay be destroyed by the cautery. Dermoid cysts of the floor of the mouth are, when small and superficial, dissected out by an internal operation. When large and deeply seated, an external dissection is to be preferred.

Mention the congenital malformations of the thyroid body.

Absence of the thyroid body in whole or in part has been occasionally observed, and congenital atrophy is sometimes seen.

To what are acquired atrophic malformations due?

They are due to injuries, diseases and to surgical operations.

What is the treatment of thyroid diseases and what the results?

The best treatment is by thyroid extract or the transplantation of the thyroid body of the sheep into the connective tissue or the abdomen. The total destruction or removal of the thyroid results in acute mania, tetany, hysteria, myxoedema or cachexia strumapriva. These complications are avoided by the removal of all but one-fourth or one-fifth of the mass, leaving that part which is adherent to the trachea.

What is goitre and what are the causes producing it?

Goitre, bronchocele, struma, Derbyshire neck or tracheocele is a hypertrophy of the thyroid body. This hypertrophy may be either local or general and may be of any size. The hypertrophy is especially on the right side.

The causes are unknown. The disease is endemic in the mountains and valleys of Europe, Asia, Chili and Mexico. Women are especially liable to it, pregnancy and the menstrual function having some influence in its production.

What are the varieties of goitre?

1. (a) Universal hypertrophy of all the constituents.

(b) Glandular—A decrease in the stroma and an increase in the glandular elements.

(c) Fibrinous—A decrease in the glandular elements and an increase in the stroma.

(d) Cystic—Cysts full of mucin or colloid material; fatty metamorphosis.

(e) Vascular—Having cavernous venous tissue..

2. Malignant goitre, sarcoma or carcinoma characterized by rapid growth, fixation and glandular enlargement.

3. Exophthalmic goitre, associated with eye protrusion and rapid heart action. Usually medicine is of value in the early stages; but, later, operation is occasionally indicated.

What are the symptoms of goitre?

The course is chronic and slow. It rarely occurs before ten years of age. There are occasionally acute congestions causing severe dyspnoea. It moves up and down with the larynx and the trachea in deglutition. It is non-adherent unless malignant. It is covered with distended veins. An unequal growth often distorts the trachea displaces vessels and causes dysphagia. It may alter the voice from interference with the recurrent laryngeal nerves. A blowing murmur from the vascularity is often heard; therefore, it may simulate aneurysm.

What is the treatment for goitre?

The treatment consists in giving iodine, the application of a red iodine of mercury salve, the employment of electrolysis, or the radical operation. Cysts may be tapped, incised, packed and drained. When congestion and dyspnoea show themselves, divide the isthmus, apply ice

and resort to tracheotomy. Excision, or a shelling out of the body should not be total, and care should be exercised not to injure the recurrent laryngeal nerves.

The incision should be a long sharp curve from one side to the other with the convexity toward the sternum. Attack the upper portion of the body first, tieing the upper, middle and inferior vessels in order. When possible, lift the body from its bed and encircle the pedicle with an elastic tubing before enucleating (Rose and Pappert). Be careful not to tear the trachea; if this happens, introduce a long tracheotomy cannula at once.

Give a description of thyroiditis and its causes, symptoms and treatment.

Thyroiditis, inflammatory goitre, acute goitre or strumitis is an inflammation of the thyroid gland and it is usually unilateral.

Causes—External, e. g. various traumatisms, infection of an ordinary wound, the influence of cold, etc. Internal, e. g. effort causing a haematoma, the influence of rheumatism, a pre-existing infectious disease as pyaemia, typhoid fever or malaria.

Symptoms—Great thirst from difficulty in and aversion to drinking because of pain caused by swallowing; raising at each pulsation; cephalic symptoms due to pressure upon the veins, and great congestion of the face and epistaxis from the same cause; nausea and vomiting from pressure on the pneumogastric nerves.

Treatment—This may consist in incision, disinfection and drainage. It may be treated as goitre.

HARE-LIP AND CLEFT PALATE.

Describe hare-lip and cleft palate and tell how these malformations occur.

They are due to arrested development in the embryonic growth. Very early, the foetus has, in its cephalic extremity, clefts which are separated by branchial arches. These clefts communicate with the alimentary canal. The mandibular arch consists of (a), a superior maxillary portion which does not unite, the gap being filled with the fronto-nasal process and an intermaxillary bone; and (b), an inferior maxillary portion which unites early, forming the lower jaw. Between these portions is the buccal cleft. The union between the superior maxillary portions (with its growth of a horizontal septum backwards) and the mesial and naso-frontal processes forms the palate and the lip. If the mesial and naso-frontal processes do not meet it, we have hare-lip single or double, and more or less complete. If the horizontal plate does not unite with its fellow of the opposite side, cleft palate results. On account of the intermaxillary bones at the end of the naso-frontal process, hare-lip is either one-sided or double. On account of the median union of the horizontal plates, cleft palate is median.

Mention the varieties of hare-lip.

They may be single or double, and may involve the soft parts only or both the soft and the hard parts from the notch in front to the pharynx behind with an overhanging intermaxillary bone; or, they may be complicated with fissure from the orbits running down the cheek, caused by the failure of the orbital clefts to close. The single are the most common and the double comprise about ten per cent.

What is the best time to operate hare-lip?

This depends on the circumstances. If the child cannot nurse or be fed, operate at once; but, as infants stand operations badly, if the child

can possibly nurse, it is advisable to wait till it can stand the loss of blood. Between the third and sixth months and usually before dentition is the best time to operate. Some say to operate between the sixth week and the third month.

Mention and describe briefly some of the operations for hare-lip.

Nelaton's Operation—This is done when the hare-lip consists merely of a superficial notch. An A-shaped incision is made in the skin over the notch and the lower strip of skin drawn down, incision being converted into a rhomboidal one (modified); and the edges are coapted and sutured.

Malgaigne's operation is done for a slit with perfectly equal sides. A cut is made along both sides of the slit in the shape of an inverted V. The flaps are then drawn down and their exposed edges sutured.

Mirault's operation is done for a slit of unequal sides. Freshen the edges of the long side, turn down a flap from the short side and suture.

Giralde's operation is done for a hare-lip where the floor of the nose is absent. From one side of the slit, a flap is turned down; and from the other side, a flap is turned up.

Describe an operation for double hare-lip.

Freshen the edges of the intermediate section, turn a flap down from each of the other two sides and suture.

In all the above eperations, the parts may be held in position with deeply buried pins or sutures. The pins should be removed after forty-eight hours.

What are the varieties of cleft palate?

A simple notch or a bifid uvula, or one extending through the soft palate, or through the soft and part of the hard palate, or, one through the soft and hard palates and the whole of the intermaxillary bones with a hare-lip. They are partial or complète, and end singly or doubly.

What are the symptoms resulting from cleft palate?

Regurgitation of food causing starvation, oesophageal catarrh, occasionally faulty articulation and nasal voice, which persists after an operation if performed late.

At what age should cleft palate be operated?

If delayed too long, the defective speech will remain uncured. If operated too early the cooperation of the child cannot be had. The best time, therefore, is just as soon as the child can cooperate. Some say as soon as possible after the child talks.

Describe the treatment for cleft palate.

For the soft palate, staphylorraphy is used. First pare the edges, paying especial attention to the angles. Suture the soft palate together with a Hagedorn needle and silkworm gut preferably. The suture will be single on one side and double on the other unless the needle can be pushed through both sides. Do not tie the sutres too tight. Divide the levator and tensor palati muscles internal to the hamular process with a tenotome and cut upwards; or, to relax these muscles, chisel away the hamular processes (Billroth)). Paint with a varnish of an alcoholic solution of iodoform and resin. Remove the stitches in a week and close any small openings that may have failed to unite with lunar caustic.

Uranoplasty is used for cleft of the hard palate. Pare the edges, raise all the soft parts from the bone with the periosteal elevator, being careful to avoid the vessels of the anterior and posterior palatine canals. Free the soft palate from the hard and introduce the sutures as before, beginning at the junction of the hard and soft palates. Incise the soft

parts between the alveolar processes and apply sutures on either side, continuing the same into the soft palate. Relax the soft palate as before if necessary.

What can be said of cheiloplastic operations?

They are operations performed for the restoration of the upper or lower lips or for deviations of the angles. They consist in sliding flaps with a pedicle, or in transplanting flaps from the neck and face. These flaps must be muco-cutaneous, i. e., formed of skin on one side and mucous membrane on the other. Skin grafting is often of useful assistance in filling in gaps.

SURGICAL DISEASES AND INJURIES OF THE LIPS.

Mention some of the abnormal conditions of the lips.

Inflammation, cracks, fissures, ulcers, hypertrophy, epitheliomata, naevi, cysts, horny growths, syphilis primary and secondary, etc.

Describe inflammation of the lips.

This may consist in a chapping or a cracking of the lips, a condition occuring most frequently in the winter. If persistent, epithelioma should be suspected.

Healing takes place ordinarily by protecting with court plaster, collodion or ointments.

What can be said of fissures of the lips and their treatment?

Tubercular fissures in children are usually associated with eye, nose and neck manifestations. They occur especially on the upper lip and are very intractable. The treatment for them should be constitutional as well as protective and healing.

Syphilitic ulcers and fissures are usually found in the corners. They are aggravated and made chronic by tobacco, etc. They must be treated by superficial cauterization and protection afterwards. After the fissures are healed, ugly clefts may remain which may require freshening and suturing.

What is macrocheilia?

This is hypertrophy of the lips which may become so thick as to present deformity. It frequently occurs in only a mild degree and may be on either lip and is usually partial. It is found mostly in scrofulous children and is virtually a redundant mucosa, which is very upnsightly and interferes with the function.

What is the treatment for hypertrophy of the lips?

The operation may consist in taking out a V-shaped mass as in excision of carcinoma; or in removing an elliptical-shaped section of mucous membrane when the lips are much everted.

What can be said of wounds of the lips and their treatment?

Wounds of the lips are rare. The tissue has a high vitality and repairs itself readily. Accurate approximation by suturing should be obtained. Haemorrhage may be arrested by pressure on the vessels supplying the lips and by suturing.

Describe epithelioma of the lips.

It is common in the lower lip, the upper being seldom involved. It occurs in males especially and after middle life. Its course is usually slow and glandular involvement is late. It may appear as a wart, an excoriation, fissure, ulcer, scab or nodule. Later, there is more or less induration which increases; then offensive discharge, bleeding, fungation, eating away, submaxillary and cervical glandular involvement,

pain, exhaustion and death. They can be differentiated from the lesions of syphilis by a microscopical examination.

What is the treatment for epithelioma of the lip?

If seen early, excise; if late, remove the involved glands and even portions of the jaw if necessary. Avoid caustics. The operations may be any of the following:

1. Incision, removing a horizontal ellipse. 2. The V-shaped incision. 3. The operation of Celsus. 4. That of Malgaigne (flap). 5. Those of Syme and Buchanan (flaps). 6. Buck's operation. 7. Sedillot's operation (flap).

How are naevi and cysts of the lip treated?

Naevi are treated by a ligature and subcutaneous excision, or by the use of the thermo-cautery, or by electrolysis.

Cysts usually occur in the mucous follicles on the inside of the lower lip. They are treated by incision and irritation and by the use of the cautery.

SURGICAL DISEASES AND INJURIES OF THE MOUTH, TONGUE, GUMS AND JAWS.

Define and describe macrostoma and give the treatment for this condition.

Macrostoma is a term applied to an abnormally large mouth. It may be congenital or acquired. The mouth may extend to the ear. The congenital forms are from a non-union of the superior and inferior portions of the mandibular arch; and the acquired are from imperfectly healed wounds, etc.

They are occasionally treated by freshening the parts to be coapted and suturing the same.

Describe microstoma and tell how it is treated.

An abnormally small mouth is a condition known as microstoma. It is occasionally congenital when it may be complete. It is then called atresia oris. It may result from operations on the lower lip and is then known as "sucker mouth." It usually results from burns, scalds and ulcerations, and in these conditions it may be associated with eversion of the lip which may result also from a long fraenum.

Treatment—Incision and union of the mucosa and the skin. A cicatrix, if present may be excised and followed by a plastic operation. It may also be treated by shortening the fraenum and by persistent dilatation.

Mention the malformations of the tongue that may be met with.

Tongue-tie; very long fraenum; bifid tinque (rare); an abnormally large or long tongue or an abnormally small tonuge; total absence of the tongue.

Give a brief description of tongue-tie and its treatment and that of elongated fraenum.

It is a congenital condition of a very short fraenum, or a growing together of the under surface of the tongue and the floor of the mouth. It is easily recognized and causes deficient articulation.

The treatment consists in a division of the fraenum with curved scissors, care being exercised to avoid injuring the ranine arteries, which run parallel to the fraenum on either side and are covered simply by the mucous membrane.

Elongated fraenum may require shortening.

What is macroglossia and how is this condition treated?

Macroglossia is a congenital hypertrophy of the lymphatic vessels of the tongue, being found especially in epileptics. The hypertrophy may be increased by a recurring glossitis. If left alone it may become enormous and produce a hideous deformity.

It is best treated by a V-shaped excision of the redundant portion with the knife or cautery, and an accurate flap formation and a suturing together of the remaining tissues to form a tongue.

What may be said of atrophy of the tongue?

This condition is acquired and is usually on one side. It is associated with brain disease or injuries, especially with involvement of the hypoglossal nerve.

What are the common causes of wounds of the tongue, and how are they treated?

Wounds frequently result from bites, instruments, falls, etc. If the wound is extensive, it may be repaired by deep sutures, antiseptic washes being used to prevent infection.

What is glossitis? Give its symptoms and treatment.

Glossitis is an acute inflammation of the mucous membrane or the deeper tissues of the tongue. It is usually coexistent with stomatitis and is due to the same causes and requires the same treatment. Acute inflammation of the deeper tissues is called acute parenchymatous glossitis, which may be the result of an injury, or local irritation, or be secondary to some lesion of the mucous membrane. or from mercurial ization, or its cause may not be apparent. It may be idiopathic. It may be unilateral, but is usually bilateral.

The symptoms are swelling, which may be extensive; pain and dryness of the surface with tenderness; then ulcers and abscesses may form and dyspnoea become a symptom.

Treatment—Incision and evacuation of the pus cavities, care being taken to avoid the large vessels. Follow by free drainage, antiseptic washes, etc. In cases of severe dyspnoea, tracheotomy may have to be resorted to.

How is the tongue affected by syphilis?

Syphilis of the tongue and mouth are very common. We find fissures which are irritated and tender but without induration. It may may occur as a primary lesion; or as secondary, as mucous patches or gummata; or as tertiary in the form of warts. Remedies: HNO3, Hg.KI.

The ulcers occur as a secondary lesion and are small and painful, and found especially on the sides of the tongue as a result of irritation by jagged teeth, usually. They may be treated locally by nitrate of silver and internally by mercury and nitric acid.

Describe and give the treatment for tuberculosis of the tongue.

It rarely occurs as a primary affection but is usually secondary to tuberculosis of the larynx or lungs. When primary, it should be excised immediately by complete removal with healthy tissue for some distance around. Diagnosis is difficult. The ulcer presents the characteristic sharp-cut irregular edges with flabby granulations and no indurations. It is very painful, its nerve supply being the lingual. Tuberculosis bacilli are sometimes found, which makes the diagnosis by the microscope easy.

The treatment of the secondary lesions should be general and palliative by the occasional use of silver nitrate and antiseptic mouth washes, or, incision and removal of the tubercular granulation tissue with a sharp spoon.

What form of carcinoma is most commonly found in the tongue, and what are its causes, diagnosis, prognosis, symptoms and treatment?

Primary epithelioma is often found in the tongue. It is a disease of middle and advanced life and is more common in males, sometimes doubtless due to the irritation from tobacco. A sharp tooth, or root, or a plate, local injury, caustics, cicatrices from old lesions, syphilis, and leucoma (sporiasis) may all be factors in its production. The growth is oftenest located at the sides of the anterior half of the tongue and on the under side of the tip.

The prognosis depends on an early diagnosis which is made from induration, chronicity of the lesion, age of the patient and the exclusion of other lesions, as granulomata, syphilis, etc. If in doubt, resort to microscopical examination, or remove and examine for symptoms a year or eighteen months later.

Symptoms—A crack or fissure; a nodule or ulcer, which refuses to heal; and induration. Infiltration of the floor of the mouth, the gums, tonsils, pillars, fauces, the submaxillary and sublingual and cervical glands, and even involvement of the jaw may be found. There is fixation and hardness of the growth; the glands are large, hard and fixed. There is salivation, fetor, interference with speech, mastication and deglutition, cachexia, gradual exhaustion, septic infection, haemorrhage and great suffering.

Treatment—Early and complete removal of a part or all of the tongue.

What are the dangers of complete excision of the tongue?

Haemorrhage and sepsis.

Haemorrhage—Apply the finger to the epiglottis, hook forward the os hyoides, putting the ligaments on the stretch. Haemorrhages may be prevented by a preliminary ligation of the lingual and facial arteries.

Sepsis may cause pneumonia and septicaemia, hence, operations from the outside and tracheotomy should be performed.

Describe the Whitehead operation for removal of the tongue.

Free the tongue from the floor of the mouth; divide; catch the lingual arteries; pass a loop of silk through the glosso-epiglotidian fold and excise with the scissors.

What is Kocher's operation for removal of the tongue?

In cases of extensive involvement, a preliminary tracheotomy is necessary, after the introduction of the tube, the pharynx is plugged with a sponge or gauze with a ligature attached. The incision is then made from the ear to the middle of the sterno-cleido-mastoid muscle, to the hyoid and then up to the chin. Dissect the flap upward; tie the facial and lingual arteries in Lesser's triangle, and remove the submaxillary and sublingual glands. Separate the mylo-hyoid from its attachment to the maxilla and draw the tongue out through the incision. If the entire tongue is to be removed, the lingual artery of the opposite side must first be ligated. The tongue may now be removed with the cautery or scissors, every bleeding point being ligated as the operation proceeds. Pack the cavity with iodoform gauze and allow the wound to heal by granulation. The tracheotomy tube may be removed or left in for a number of days. The patient is fed through a stomach tube.

Mention and describe the varieties of naevi of the tongue and give the treatment.

Naevi of the tongue may be divided into arterial, venous and capillary varieties, according to the preponderance of one or the other systems of blood vessels involved. They are, as a rule, often congenital and often present themselves as very small tumors at birth, which may

grow rapidly and involve a large portion of the tongue or neighboring structures.

Treatment:—A clean excision should be made when possible; when not, ligation or the use of the galvano-cautery needles is the proper treatment.

Describe abscess of the gum and give its course and treatment.

It is a "gum boil," and is usually from a periodontitis or a suppuration of the dental pulp. The abscess may open through the gum or at the lower margin of the jaw, and it is usually associated with necrosis.

The symptoms are toothache, a tender, elongated tooth, swelling of the side of the face, with signs of abscess.

Treatment:—Iodine and aconite tincture locally. Attention should be given the tooth by the dentist, or it should be extracted, or an incision of the gum made, or one along the angle of the jaw.

What are the causes and symptoms of empyema of the antrum of Highmore?

It usually results secondarily from inflammatory lesions of the teeth and upper jaw, or of the nasal cavity.

The symptoms are pain and swelling, with a discharge of pus through a fistula into the mouth or nose when an exit exists; otherwise, distending the antrum, it may appear as a prominence on the cheek or in the mouth, or it may cause a protrusion of the eyeball.

What is the treatment for empyema of the antrum?

Remove the cause and drain the cavity. This may be possible if caused by a tooth which on removal leaves an opening into the antrum. If no exit exist, an opening may be made and drainage established, by a silver or rubber tube, into the mouth, or into the nose through an artificial opening.

What are the causes of necrosis of the jaw?

Zymotic diseases, lowered vitality, injury, tuberculosis. syphilis, a carious tooth, or mercurial, or phosphorus poisoning. Tuberculosis is usually in the form of caries. Necrosis from phosphorus poisoning is rapid and usually extensive, but rare now because of better hygiene.

Give the symptoms of necrosis of the jaw and the treatment.

There is severe pain; signs of inflammation; then of suppuration; characteristic sinuses, and a roughened bone.

Treatment:—This should be the same as elsewhere, but inside the mouth, if possible, when a sequestrum is to be removed.

What is an epulis?

It is a tumor found upon the gum, springing from the alveolar periosteum or the socket of a tooth. The varieties are benign (fibrous or naevoid) and malignant (usually myelo-sarcoma). The benign are from the pulp, the fibrous and naevoid springing from alongside the tooth. They are very common. The malignant are rapid in growth, and are vascular and purple and bleed easily. They are also fungating and hard to distinguish from the benign naevoid variety.

What is the treatment for epulis?

In the benign variety, remove the tooth and the alveolus forming the socket. In malignant epulis, remove a portion of the jaw. (Hey's saw and pliers).

What kinds of septic tumors do we find in the gums and what is their treatment?

Benign and malignant cystic tumors. The benign are usually found in the upper jaw in young people. They are often caused by a contained tooth, and are smooth and sometimes fluctuate, or they may

crackle. They are treated by incison from the inside if possible. The tooth is removed and the mucilage-like fluid is drained off.

The malignant cystic tumors are multilocular and are usually found in the lower jaw. They resemble a degenerated sarcoma or even a carcinoma. They are treated by total extirpation, resection usually being performed.

Mention the benign solid tumors of the jaw and give a short description of each.

Fibromata—These are slow in growth and painless, springing especially from the periosteum of the alveolus (fibrous epulis) or from the endosteum of either jaw, causing expansion, and, if in the upper jaw, pressing on the nose, antrum, orbit, or the mouth. They are treated by excision.

Enchondromata—These are rarer than the fibromata and are more rapid in growth and are harder and lobulated. They are found especially in the lower jaw and in the antrum. They are treated by removal and are apt to recur.

Osteomata—These are very rare tumors, being very hard and slow of growth. They may form exostoses and general thickenings.

Describe the malignant solid tumors of the jaw.

Carcinomata—They are rarely primary and are usually secondary to similar growths of the nose and palate. Their growth is rapid. There is destruction of bone, fungation, ulceration, bleeding and an offensive discharge. They are painful.

Sarcomata—These are of the round-celled and myeloid varieties and are found especially in the upper jaw. They may fungate into the nose and throat or grow out. They usually begin in the antrum, and their growth is rapid. They are soft; there is no glandular metastasis, and they are often hard to distinguish from periosteitis and even abscess.

OPERATIONS ON THE JAW.

What is the best incision for the removal of the upper jaw?

The upper lip is slit at its middle, and the incision is carried around the ala nasi and upward to the inner angle of the eye, along the lower margin of the orbit to the outer and lower angle. Excise to the periosteum and dissect the flap up from the bones and turn downward and outward. Check all haemorrhages. Draw the incisors and saw through the hard palate and alveolus. Saw or bite away the malar and nasal processes. Wrench out the jaw, pack the cavity with gauze and suture accurately. The appearance is very satisfactory.

How is the lower jaw resected?

Make an incision along the lower border of the jaw, raise the soft structures by a blunt dissection and remove the jaw by a central division and by turning it out and completely freeing it.

How are alveolar growths treated?

They are removed with biters, Hay's saw, etc., through the mouth.

What condition is sometimes met with at the temporo-maxillary articulation?

Inflammation or a temporo-maxillary articulitis, resulting possibly in ankylosis. The inflammation is never tubercular, but is often a rheumatic arthritis. It may be an acute arthritis from trauma, acute or infectious diseases, acute rheumatism, gonorrhoea, etc. There may occur a temporary or reflex closure from irritation of a tooth, eruption, non-eruption, or want of room. It may occasionally be hysterical; if so, it

disappears under ether. Permanent closure results from suppurative arthritis, or from cicatrices from burns, or from ulcerations of the mucosa, and from injuries.

How is ankylosis of the jaw treated?

Forcible separation may be tried or a false joint made by a division of the condyloid process, and, if necessary, the coronoid process. When there is extensive cicatricial contraction of the soft tissues, a plastic operation will be necessary. These operations do not always result satisfactorily.

When is tonsilitis a surgical disease?

It is of interest surgically only in case of abscess. This usually ruptures about the ninth day; but if both tonsils are invoived and the swelling is severe an operation may be required. In incising the tonsils be careful to keep inside the line of the teeth.

Describe hypertrophy of the tonsils and give the treatment.

It consists in an abnormal increase in the lymphoid tissue and occasionally in a proliferation of its fibrous stroma. It may result from repeated acute attacks or from a catarrhal condition and is oftenest found in tubercular children. It usually comes on at the age of puberty and is seldom seen after the age of thirty. It results in catarrh, mouth breathing, snoring, nasal speech and a tendency to acute attacks.

Treatment:—Internally, baryta carbonica, baryta iodide and the calcarea compounds may be given. Tonsillotomy may be resorted to. Using the head mirror and having the assistant hold the patient's head and press on the tonsilar region from without, press the ring of the tonsillotome over the tonsil, and, after fixation with the spear of the instrument, quickly excise the tonsil and remove from the mouth. This may be done without an anaesthetic and the other tonsil removed before the patient realizes that a second operation is to be performed. Chloroform or nitrous oxide may be used in nervous and excitable children, and cocaine or eucaine is sometimes employed. The mortality is exceedingly low. Haemorrhage is usually not severe and ceases spontanously after a short time. When the haemorrhage is severe it may be checked by direct application of haemostatics, or by sucking cracked ice. It may be necessary to ligate the carotid.

Mention and describe some other diseases of the tonsils.

Concretions—These may be calcareous or cheesy, and vary in size. They may be enucleated or curetted out.

Sarcoma and lympho-sarcoma—These sometimes occur in the young, usually below the age of twenty.

Epitheliomata—These are usually secondary and result from glandular mestastases. They may be treated by excision of the tonsil from the outside (pharyngotomy) or through the mouth. Externally Mikulicz's and Czerny's operations may be used. For descriptions of these operations consult the text books.

SURGICAL DISEASES AND INJURIES OF THE PHARYNX.

Mention some of the congenital malformations of the pharynx.

They occur as the remnants of the branchial clefts and are found in the forms of fistulae, diverticula and cysts.

Fistulae are by far the most common. These are usually incomplete, unilateral and more common on the right side. Their external opening is usually found upon the side of the neck anywhere along a line from the angle of the jaw to the sterno-clavicular articulation. Internally,

they generally open into the side wall of the pharynx near the tonsils. The canal usually varies in length and diameter and is tortuous.

How are pharyngeal fistulae treated?

The treatment is sometimes very difficult and operations are often dangerous. Caustic injections, notably those of iodine, are used to destroy the epithelial lining of the canal. Direct cauterization with the galvano-cautery is also used, or radical extirpation of the fistula throughout its entire extent.

What are the causes and symptoms of retropharyngeal abscess?

It occurs often as a result of caries of the cervical vertebrae or as a sequence to infectious diseases (as a post scarlatinal manifestation), and is due to a breaking of the lymph nodes.

Symptoms:—When the onset is sudden there is high fever, headache, vomiting and sometimes chills and convulsions. There is pain in swallowing, especially marked in the back of the throat and increased by movements of the head; dysphonia, dysphagia and especially dyspnoea.

How may retropharyngeal abscess be treated?

The best method is by an incision with a protected knife from the outside, as this permits of a thorough evacuation and treatment of the cavity. Haemorrhages from an erosion of one of the great blood vessels is almost necessarily fatal, though the common carotid has been successfully tied.

What can be said of tumors of the pharynx?

These are generally known as naso-pharyngeal tumors and are rare. The fibrous tumors especially are found in the naso-pharynx or hanging from the vault, growing from the body of the sphenoid or the base of the occipital bone. They also occur by extension of malignant growths. The galvano-caustic loop, or the cold snare, or electrolysis may be employed in their removal.

SURGICAL DISEASES AND INJURIES OF THE OESOPHAGUS.

Mention the malformations of the oesophagus.

They are the same as those of the pharynx, fistulae, diverticula and cysts, and are of branchial origin.

Give the causes and the treatment of sacculation of the oesophagus.

It usually follows a constriction of the oesophagus. It has been excised at the pharyngo-oesophageal junction.

Name and describe the varieties of strictures of the oesophagus.

Strictures may be: 1. Organic, (a) cicatricial or simple; (b) malignant or cancerous. 2. Non-organic, or spasmodic and hysterical. 3. Those resulting from outside pressure.

Cicatricial stricture is caused by wounds, corrosives or syphilis, and their most common site is opposite the cricoid cartilage.

Cancerous stricture occurs most frequently in men over the age of forty-five in the form of epithelioma. They are found in the lower one-third.

Spasmodic stricture, or oesophagismus, occurs in hysterical subjects of any age, but chiefly in women. The patient complains often of globus hystericus.

Give the diagnosis and treatment of oesophageal stricture.

It is diagnosed by dysphagia, emaciation, regurgitation, by the careful passage of an oesophageal bougie. By auscultation the trickling

fluids can be heard. In the cancerous variety there are shreds and bleeding. Haemorrhage may also occur in liver diseases.

Treatment:—Dilatation is successfully employed in the cicatricial variety, but this is dangerous in the cancerous. Permanent tubage is employed for either variety, using the long or the short tube. Oesophagotomy is sometimes done externally and internally. Gastrotomy is also employed for digital exploration and retrograde catheterization; and gastrostomy has been used in the cancerous variety. The X-rays are used to locate foreign bodies.

Where are the normal narrowings of the oesophagus?

At its commencement and at its point of passage through the diaphragm.

Describe wounds of the oesophagus and their treatment.

They occur externally (rarely) in consequence of injuries, and internally by the action of sharp-pointed foreign bodies.

When the wound is external, either leave it open, packing with gauze and feeding with an oesophageal tube, or suture the tear in the walls and drain the cervical wound with iodoform gauze for a few days.

In internal wounds rest and nutrient enemata are indicated. In rare cases gastrostomy is performed, and the patient is nourished until the wound in the oesophagus has had time to heal.

Where are foreign bodies located in the oesophagus and what are the symptoms?

Foreign bodies are common, being found in the region of the cricoid cartilage, the crossing of the bronchus and its passage through the diaphragm.

The symptoms are pain and dysphagia, especially in cases where the foreign body is located high up. These symptoms often persist after the removal of the offending body.

What are the treatments for foreign bodies in the oesophagus?

Treatment is often extremely difficult. They may be removed by instrumental means through the mouth, by external incision or oesophagotomy, or, lastly, by gastrostomy.

Describe external and internal oesophagotomy.

In external oesophagotomy the incision is made upon the left side of the neck along the anterior and inner edge of the sterno-mastoid muscle just below the thyroid cartilage, between the larynx and the trachea on the inner side and the vessels on the outer side. After cutting through the skin, superficial and deep fascia and the muscles, pull aside the sterno-mastoid and divide the omo-hyoid. The descendens noni and the recurrent laryngeal nerves and the superior and inferior thyroid arteries must be protected from injury. A male sound can be introduced through the mouth, and the wall of the oesophagus divided on the beak. The edges of the wound thus made may be held apart by silk ligatures attached to the lips. Free inspection and instrumental manipulation are now possible. The wound can be sutured immediately with catgut to obtain primary union, or the wound is packed with iodoform gauze, and healing by granulation takes place.

Internal oesophagotomy consists in dividing the strictures by the introduction of instruments through the mouth in a similar way to those used in the urethra. This is very dangerous, the mortality being nearly 25 per cent.

SURGICAL DISEASES AND INJURIES OF THE BREAST.

Give briefly the anatomy of the breast.

Its boundaries are indefinite. It is not circular in outline, but has three cusps, one overlapping the sternum and two leading to the axilla, one above and the other below. The connective tissue attaches it firmly to the deeper fascia and envelopes it between its two layers as a capsule. Posterior to it lie loose tissue, deep fascia and muscle. The long axis of the gland is from the axillary fold downward and inward. The skin, superficial fascia, and the capsule are united by fibrous bands, the ligamenta suspensoria. The breast is made up of minute lobules, each with its own duct; and lobes with their larger ejaculatory ducts, fifteen or twenty in number. The blood supply is principally through the internal mammary and intercostal arteries. The lymphatics form three streams, toward the axilla, toward the sternum and directly backward to the muscle.

Mention some of the malformations of the breast.

Complete absence of one breast (Amazon thorax) or of both breasts is most rare. Supernumerary breasts (polymastia) or multiple nipples are not uncommon.

Mention a few facts about inflammation and retraction of the nipple.

Inflammation results in ulceration or lymphatic infection, producing abscess. It should be treated by shielding the breasts, by weaning the child, by massage, and by the use of internal remedies.

Retraction of the nipple is congenital or from a cicatrix.

What is Paget's disease of the nipple?

It is a destructive disease of the nipple and aroela, which attacks women usually and sometimes men between the ages of forty and sixty. It resembles eczema and is often so called. There is a brawny desquamation with the formation of crusts and a watery discharge. These crusts on falling off leave non-granular surfaces. The disease spreads from the centre to the periphery. If sure of the nature of the malady, the diseased tissue may be scraped away with a curette and a 30-per-cent. solution of zinc chloride applied. It is important from its relation to carcinoma. The failure of ordinary treatment and the appearance of malignant growths calls for excision of the entire breast.

In what do neuroses of the breast consist, and what is the treatment?

They occur in young single women usually as neuralgias and hyperaesthesias. The patient should be treated and not the breast.

Give descriptions of hypertrophy, tuberculosis and syphilis of the breast.

Hypertrophy usually begins at puberty or any time up to thirty years of age. There is one breast on record that weighed sixty-four pounds. Compression and support alleviate the condition. Lactation is reported to have cured several cases. Amputation of one breast or both may be necessary.

Tuberculosis of the breast is manifested in the lesions usually found elsewhere. These lesions are rarely primary, but are usually secondary. The best treatment is excision, or an incision may be made and the wound curetted and packed.

Syphilis—Chancre may appear and a secondary eruption occur, especially in the sweaty crease. Induration is uniform and general enlargement comes on in the late secondary or early tertiary stages. It should be treated by the iodide of potash or mercury.

Describe mastitis.

Mastitis or mammitis is an acute or chronic inflammation of the breast, often dating from the time the nurse "rubbed away the milk." It may occur in boys or girls at pubery or it may result from traumatism, especially in nursing women, from injury to the nipple, from overfilling or from exposure to cold. It also occurs in run down patients.

The symptoms are uneasiness and pain (early); then there is chill and fever, swelling, heat, redness and pain.

It may result in resolution, suppuration or chronic induration.

The varieties are:

1. Superficial: Between the skin and the gland.
2. Interlobular: Glandular, single or multiple.
3. Post-mammary: Originating in the costal portions, usually behind the glands. It is often tubercular in origin. It pushes the nipple forward as a conical projection with a large inflamed base. It opens naturally at the internal and external borders. If in the costal side of the gland it may riddle it.

Treatment: If seen early, the inflammation should be treated by a cold compress and lead water and the internal remedies. The superficial varieties should be incised at the thinnest portion of the wall and free drainage set up. Incision is sometimes a necessity in the interlobular variety, though there is great danger of cutting into the lobules and ducts, thus destroying them. Later, in the post-mammary variety, it may be necessary to excise the whole gland.

Incisions should be followed by packing with gauze and the application of an abundance of antiseptic dressings. Avoid pressure.

What can be said of chronic mastitis?

It often follows the acute variety and is found frequently in both breasts. The pain is severe and neuralgic in character. The differentiation from carcinoma is difficult.

CARCINOMA.	CHRONIC INDURATION.
Stony hard.	Leathery hard.
Size usually unaffected by menstruation.	Increased size during menstruation.
Confined to one breast.	Both breasts frequently affected.
Growth rapid.	Growth very slow.
Lymphatics always enlarged (late).	Lymphatics usually not enlarged.
Always cachexia (late).	No cachexia.
Grows worse.	Improves or remains stationary.

Treatment:—It may be treated locally by strapping with adhesive strips, which make equal pressure and promote absorption of the new-formed connective tissue. Incision and excision are usually necessary if it persists after the usual treatment.

TUMORS OF THE BREAST.

Mention and describe the various tumors found in the breast.

Nearly all varieties occur in the breast as pure and as mixed types. These are adenomata (6 per cent.), fibromata, cysts (2 per cent.), sarcoma (7 per cent.), carcinoma (85 per cent.), degenerations (pigmentary and cystic). The malignant tumors of the breast comprise 90 per cent. of the entire number. One-fourth of all cancers and one-fifth of all tumors occur in the breast.

Varieties:—

Cysts—Retention or glandular, lymphatic (rare), hydatid (very rare).

Adenomata—Occur from puberty till menapause, especially between the ages of thirty and thirty-three years. They affect single lobules,

whereas hypertrophy affects the entire breast. They may be acinous, tubular, adeno-fibroma, or adeno-fibro-cystoma. Their growth is slow and painless. They are encapsulated and non-adherent. There is slight discharge from the nipple, but no glandular enlargements.

Sarcoma—Round, spindle and giant-celled varieties are found. More frequently the sarcoma cells invade a fibroma or adenoma and form adeno-sarcoma and fibro-sarcoma, or infiltrated with pigment cells, a melano-sarcoma. They occur between the age of puberty and the age of thirty. Their growth is slow at first and then rapid. Symptoms:—They become large and of a dark reddish-brown color, with the veins showing through. The skin is stretched and shiny. When the entire gland is involved, it is called sarcoma en masse.

Carcinoma:—These tumors occur as acinous or tubular, according to whether the seat of the growth is in the acini or in the tubules. The amount of stroma forming the alveolar spaces and the rapidity of the growth determine the clinical variety. The scirrhus variety is the most frequent and begins usually as a hard nodule in the periphery of the breast, in the upper outer quadrant. The next most usual position is below the nipple and areola. The left breast is more frequently affected than the right, but both breasts are involved occasionally.

Symptoms: 1. Pain distressing (late, not early).

2. Usually discovered as a nodule by the patient while in the bath or dressing.

3. Growth rapidly progressive; more so than benign tumors of smaller size than sarcoma. There is a distinct change in from 3 to 6 months.

4. Fixation (an early and an important sign) and skin involvement. The whole breast moves with the tumor, it being attached to both skin and chest. There is retraction of the nipple due to the contracting tendency of the tumor, drawing in the ligamenta suspensoria. Later there is infiltration of the skin which becomes hard and board-like. The ribs are so fixed that respiratory movements on that side are interfered with. This is called cancer en cuirasse. The scirrhous variety may take on atrophic changes, making the growth relatively slow.

5. Lymphatic involvement early. Those of the axilla are first affected if the tumor is nearer that locality; the mediastinal nodes would be first involved if the tumor were on the sternal side. When near the nipple, both infraclavicular and axillary nodes are early involved.

6. Metastases in other organs.

7. Cachexia.

Give the operative treatment for malignant tumors of the breast.

The Halstead operation is a good example of a complete operation. It consists of

(a) Extirpation of the entire breast, together with its two prolongations toward the upper and lower axilla, the offshoot toward the sternum, and any accessory outlying islets.

(b) Removal of all overlying skin, plus a liberal, healthy, zone of cutaneous as well as connective and fatty tissue.

(c) Excision of the entire pectoralis major muscle, from its point of origin on the chest-wall almost to its insertion in the arm, with its fascia.

(d) Division of the minor pectoral, and an absolute emptying of the axillary cone, to its very apex, of all fat and glands, not even sparing vessels and nerves, if necessary.

(e) An incision up to the middle of the clavicle to get at the lymphatics under and above the bone.

(f) The induction of primary union, i. e., a minimum of scar tissue by suture, flap-sliding, immediate skin-grafting, or the latter after granulations have sprung up, or Schede's moist clot has organized.

PLASTIC SURGERY.

What is meant by the term plastic surgery?

It is a term comprising all reparative measures, whether applied to the skin tendons, nerves or the skeleton. In its strict application, we understand by it those steps which aim at the reparation of defects and lesions of the skin only, and of the mucous membrane adjoining the natural orifices.

What are the objects of plastic surgery?

The repair by living tissues of (1) congenital and acquired defects of the skin and adjoining mucous membranes; (2) of the consequences of simple lesions of continuity without defect; (3) of faulty arrangements of the orifices, congenital or acquired; (4) of functional disturbances or of cosmetic blemishes due to the deposition of cicatricial tissue; (5) of perforations or fistulae establishing abnormal communication between cavities, or a cavity and the open air.

Differentiate between autoplasty and heteroplasty.

Autoplasty is a term applied to a process where defects are covered by living tissues taken from the body of the patient.

Heteroplasty is the operation wherein living tissues foreign to the bearer of the defects are employed.

Mention the steps used in plastic surgery.

1. Freshen the edges. 2. Arrest the haemorrhage primarily or by suture. 3. Suture without pulling. 4. Close gaps from which flaps have been taken. 5. Dress aseptically or antiseptically and cover so as to prevent motion and handling.

What sutures are used in plastic surgery?

Silk, silver wire, buried silk or catgut, relaxation and figure of 8 sutures.

What are the unfavorable conditions for plastic surgery?

Syphilis and lupus and respiratory and intestinal disturbances when cleft palate or hare-lip are to be operated on.

Mention and describe the methods used in plastic surgery.

1. Approximation of parts or stretching or sliding tissues.

(a) Union after freshening the edges or sliding in a direct line, e. g., hare-lip, vesico-vaginal fistula.

(b) Undercutting or sliding into position after transferring the tension.

(c) Sliding in a direct line by means of parallel incisions.

(d) Sliding in a direct line by means of transverse incisions and undercutting.

(e) Sliding in a curved line.

2. Interpolation of flaps with a pedicle from near or distant parts or another person or limb (jumping).

(a) Rotating flap and pedicle on its own plane (nose, upper lid).

(b) Twisting the flap on its pedicle (side of nose).

(c) Everting the flap, raw surfaces up.

(d) Covering one everted flap with another.

(e) Carrying the flap across the intervening skin, dividing the pedicle after the flap has become attached.

(f) The same may be done by gradually carrying a flap into position by successive slidings or twistings.

3. Interpolation without a pedicle.

(a) Wolff's and recent modifications (bone after trephining, nerve transplantation).

(b) Reverdin's and Thiersch's methods of skin-grafting.

4. Retrenchment:—Elliptical, V-shaped and trapezoidal incisions (nose, ears, vagina, cystocele, ptosis).

SKIN GRAFTING.

What are the two recognized methods of skin grafting?
Reverdin's method and Thiersch's method.

Describe Reverdin's method.
Small pieces of skin are snipped off from a limb that has previously been rendered aseptic, and these pieces of skin are placed on the wound one-quarter or one-half inch apart.

Describe Thiersch's method.
This is really a skin transplantation. Thin slices of epidermis are taken off with a razor and put upon the wound so that they overlap each other slightly. The entire wound must be covered in this way.

How should the wound be prepared before the grafts are applied?
It is best to immerse the wound in a solution of bichloride of mercury for twenty-four hours. Then apply sublimate gauze and at the time of operation wash the parts with clean, plain water and destroy exuberant granulations.

What is the after treatment in skin grafting?
The grafted wound is covered with sterilized oil silk (Lisker's protector); over the latter put a layer of dry gauze and apply a bandage. A few days later see that the grafts have taken, and if so apply the same dressing. Some time after this you may supply aristol or a mixture of boracic acid powder, three parts, and iodoform, two parts. Both powders hasten cicatrization.

NERVE, MUSCLE, MUCOUS MEMBRANE AND BONE GRAFTING.

When are nerve grafts necessary?
When the gap between the ends of the nerve from a loss of nerve substance is so extensive that the ends cannot be approximated even by stretching. A nerve from a lower animal (sciatic nerve of dog has been used) or from a recently amputated limb may be used. Catgut threads and decalcified bone tubes are of no use in this connection.

What can be said of mucous membrane grafting.
It is performed on the mucous membrane of the tongue, urethra and conjunctiva the grafts being taken from the mouth, rectum, prepuce, rabbit's conjunctiva, bladder or oesophagus, pigeon's oesophagus and frog's stomach.

How are muscles grafted?
They are rarely grafted. When they are, the grafts should be larger than the defects. The sheath should be sewed if there is one. The sutures are usually placed in the muscle at a distance from the seat of

lesion, or partial sections above and below the lesions may be made to allow of approximation. Granulations can be rendered firm by compression or caustics or by freshening the raw surfaces. Observe rigid asepsis and wash off any antiseptics. Leave no blood beneath the muscle, if possible. There may be a shedding of the epidermis, or the rupture may disappear and then reappear.

How is bone grafting carried on?

A trephine button in salt solution 100—105 degrees F. or chips are used to spread over the dura. Bone grafts are also taken from animals or amputated limbs. These methods are usually unsuccessful, bone shifting with fractured attachment, or decalcified bone chips from the tibia or femur of the ox are used.

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VENEREAL DISEASES.

URETHRITIS.

What is urethritis?

An inflammation of the urethra, associated with a purulent discharge and painful micturition. Any inflammation of the urethral mucous membrane is a urethritis, but all urethral inflammations do not necessarily constitute gonorrheal infection, as they may be caused by mechanical and chemical agencies, individual idiosyncracies, vegetations, herpes, etc. Therefore, urethritis may be specific or infectious, non-specific or non-infectious.

What are the varieties of urethritis?

Bastard, syphilitic, tubercular, pseudo, traumatic and non-specific.

What is the etiology and clinical history of gonorrhoea, or acute specific anterior urethritis?

It has but one mode of origin; that is the contact of a discharge containing the gonococcus of Neisser with a mucous membrane. Under erotic excitement the urethra becomes slightly acid, affording a favorable medium for culture. A patulous meatus also favors infection. There is a period of incubation of 1 to 14 or 15 days, average 1-4 days, which is the reactionary effort of the mucous membrane. Then there is a slight tickling, crawling or itching at the meatus urinarius. The lips may be glued together or there may be present a small amount of a bluish, milky, sticky discharge. The glans penis is swollen; the urethra becomes sore, aching and tender to touch; micturition becomes both frequent and painful, and is accompanied by burning and smarting. The discharge becomes profuse and assumes a yellowish, purulent or greenish-yellow color. Chordee may be a prominent symptom. From fifth to fourteenth day the symptoms exaggerate, then during the stationary stage of 15-18 days the symptoms oscillate. On the eighteenth day the stage of decline begins—the symptoms diminish.

What is the pathology of acute specific anterior urethritis?

Examination by the Otis endoscope reveals a congested, inflamed, red and swollen mucous membrane, with here and there spots of erosion of the epithelium and the follicles of Morgagni discharging a mucopurulent fluid. The urethra may return to its normal condition, or the infiltrated submucous tissue may gradually thicken and contract, causing stricture; this anatomical change may prevent the symptoms from entirely disappearing, and there will remain a frequent desire to urinate, with a slight discharge in the morning, or a mere drop at the meatus without other symptoms being present.

What is bastard urethritis?

Not an acute attack. No period of incubation. Occurs with the history of previous attacks having left a damaged urethra. Occurs whenever venereal excesses, associated with overeating and drinking, are indulged in, even when the woman is in every way free from this disease. In the gouty and strumous it may occur without sexual indulg-

ence, but simply from excesses at the table, chilling of the extremities, overfatigue from any cause whatever, or prolonged ungratified sexual excitement. Treatment same as specific and remove cause.

What is the etiology of non-specific urethritis?

Traumatism of sufficient duration and intensity, contact with various discharges (not containing gonococci), as leucorrhoeal, lochial, menstrual, acid urine, etc. Is due to a uric acid diathesis.

Treatment:—Lycopodium; cantharis; cleanliness; correction of diet. Local treatment not needed.

What is tubercular urethritis?

It is a localized manifestation of a general tubercular condition. Has no period of incubation. Nothing can be done to cure. So simply palliate by tonics; iodoform emulsion; cod-liver oil, etc.

What is syphilitic urethritis?

Has no period of incubation; occasionally find mucous patches in mouth. Constitutional symptoms, a diagnostic point. Most any part of body may be similarly affected. Treatment.—Push mercury or KI. fearlessly.

What is pseudo-urethritis?

A discharge provoked by chancroid, polypus, etc., but no inflammation of urethra present.

What is prognosis of urethritis?

Although local and not dangerous when uncomplicated, may even terminate in death. The calices of the kidney may be reached from the posterior urethra; 80 per cent. of anterior cases result in posterior urethritis; gonorrheal rheumatism is common, may even reach a purulent stage. The brain or heart may be involved by an embolus; 75 per cent. of all cases, even untreated, recover in 4-6 weeks.

What is the treatment of acute specific anterior urethritis?

1. Expectant Method:—Employed by the French surgeons. All treatment is deferred until the stage of decline, is a very illogical and inhumane method.

2. Prophylactic Method:—(a) Continence; (b) cleanliness; (c) isolation of infected cases.

3. Hygienic Method:—Most important. For first two or three days patient should rest in bed. Frequent bathing of organ in very hot water, which diminishes chordee. Dressings of penis should be light and non-irritating. A bit of absorbent cotton saturated in bichloride (1-20,000) placed over meatus, the best. The usual milk diet is needless, but avoid highly-seasoned food, and all alcohol, especially beer and new cider.

4. Medicinal Method:—A matter of opinion. Not the quickest way to cure, yet aids. Salol or boric acid, 10 gr. after each meal. Aconite tincture, drop doses every two hours during first 24-48 hours; then gels. tincture. In the inflammatory stage: Terebinth., canth., cannab. sat., copaiva, cubebs, erigeron, ichthyol, creosote, camphor tincture.

When chordee is present tincture of camphor, 1 drop every fifteen minutes for two hours previous to retiring, will give good results. In the stage of decline, thuja, nux vom., silicea, sulphur.

5. Local Treatment:—(a) Injections, (b) continuous irrigations, (c) simple injections. Use a syringe of 2-3 drachms, hard rubber best, conical point. Have patient first urinate, in order to rid urethra of pus. Hold penis in left hand, prepuce retracted. Syringe held in right hand; contents injected thoroughly. Thirty injections should be given each day.

6. Continuous Irrigation:—Better, because more fluid can be in-

jected and the follicles and ducts cleansed to a greater degree. The pressure causes an artificial oedema and gonococci do not develop readily on such a membrane. Valentine's apparatus a good one. Use morning and evening.

The drugs employed for these local treatments are:—Permanganate of potash is the best, as it is both an antiseptic and an oxidizing agent For simple injections, ½ gr. of drug to 4 oz. water. For continuous irrigation, a 1-2000 solution, made in a quart of hot water, is used. Bichloride of mercury is next in importance—1-15,000 or 1-20,000 in continuous irrigation. Silver nitrate, 1-5000, in continuous irrigation. Copper sulphate, 1-500, and non-medicated hot water are also useful agents. Formalin jelly—a 40 per cent. solution of formalin in gelatine. Silver nitrate (4 per cent.) is used for abortive treatment, but patient must be free from constitutional taint and must present himself in first 12-24 hours of attack. It is used by injection, is an astringent and caustic, hence painful.

May cause a spastic stricture, for which give apis in a high potency.

How diagnose acute specific anterior urethritis?

Ask patient number attacks; how long apart; how soon developed. Present symptoms. Is requested to pass urine. The two-glass urine test: first glass represents the washings of entire tract, second any inflammatory products of posterior urethra. Do not use sounds or endoscope, for fear of infection of the posterior urethra. Thoroughly inspect penis, scrotum, etc. Allow no fluids to go further than peno-scrotal junction. A discharge persisting over 4 weeks is chronic. A case of urethritis is cured when:—(1) There is no visible discharge, (2) the strings are absent or rise to surface and contain no gonococci, (3) there is neither stricture nor prostatitis. The discharge may entirely disappear and all gonococci be washed away with urine. A test for cure is a double allowance of beer in drinkers, or new cider or injection of 10 per cent. solution of $AgNO_3$ in non-drinkers. If a discharge appears examine for gonococci, and if absent the man is well, unless he has had posterior urethritis or complications. If he has had posterior urethritis, test by ordering intercourse with a condom and examine the discharge for gonococci—if absent, he is cured. Strings are due to an erosion. They are made up of squamous epithelium. If they rtse to the surface of the urine there is little or no pus. Short, club-like strings are from anterior urethra—long, string-like from posterior. Unless the discharge has persisted long, there is little danger of stricture.

Give definition of stricture.

Stricture is a diminution of the dilatability of a canal, associated with tissue change. To ascertain its presence, boil, sterilize and gently pass a sound.

What are the complications of urethritis?

Posterior urethritis, epididymitis, folliculitis, Cowperitis, prostatitis, vesiculitis, cystitis, uretertis and pyelitis.

Describe posterior urethritis.

Occurs in about 80 per cent. of all cases. The urethra is surgically divided into: Anterior portion (spongy portion) and the posterior portion (membranous and prostatic), with the constrictor urethrae as the dividing line. Of the posterior portion, the memoranous urethra is about ¾ inch long, is the narrowest part and is devoid of glands and follicles; the prostatic urethra, 1¼ inches long, has several openings and is the most sensitive part of entire urethra during urination. The symptoms of posterior urethritis are: Frequent urination, which is very painful, also seminal emissions by the inflammation traveling along the ducts, inflaming the seminal vesicles, causing contractions, and so

expression of their contents. An acute attack may pass off in 5 or 6 days, if treated. A chronic case may last for years.

What is diagnosis and treatment of posterior urethritis?

The patient is instructed, if attack is moderate, to try two-glass urine test. The first glass contains washings of the entire canal and part of bladder. The second will be cloudy if there is posterior urethritis. A third glass may show pus, making the diagnosis absolute. Treatment:—Give large quantities of water internally, also boracic acid or salol, 10 gr. doses, to sterilize the urine. Aconite, cantharis, terebinth or bell. may be indicated. If very acute, place patient in bed; apply warm towels to perineum and suprapubic region. If urine is retained, give high dilutions of apis; if no results, a hot sitz bath; if no results from this, anaesthetize and pass a catheter. In any acute attack, irrigation and all local treatment should be discontinued, but after condition becomes sub-acute, may irrigate.

Describe epididymitis.

One or both tubes may be involved, yet usually only the left. Occurs in 15 per cent. of all cases. May be conveyed by the lymphatics, but a posterior urethritis is always presupposed. There is seldom any involvement of testicle (orchitis), yet occasionally have tunica vaginalis affected, with resulting exudate.

Symptoms:—Most painful of all complications. Attack commences with sharp chill, rapid rise of temperature (105-6 degrees). Pain in inguinal and lumbo-sacral region, as well as scrotum. Brow knitted; perspiration. Facial expression characteristic. No relief except flat upon back, with parts elevated. Can walk but a few steps. Tender perineum. Discharge immediately suppressed, therefore scrotum appears like a tumor, size of fist on posterior side; skin tense, red and shiny. Acute attack disappears spontaneously within two or three days.

Treatment:—Put patient to bed; rest the parts. Poultice of equal parts tobacco and flaxseed. No injections. Good results from puls. (5 drops tincture every 3 hours). Bell, 3x. for pains. Hepar high, if pus threatens. Aconite in incipiency. Morphia if patient can't sleep.

Describe folliculitis.

From urethritis the periurethral tissues may become involved, especially at (1) fossa navicularis, (2) bulbous portion about the glands, (3) prostatic region. The follicles become inflamed, causing swelling, hyperaemia and effusion, cysts or tumors, called folliculitis. Resolution usually occurs, but abscesses may form. When the inflammation extends deeply it is called peri-glandular inflammation or cellulitis, which is a grave condition. Also called penitis when it involves the cellular tissue of entire penis. Urinary infiltration or extravasation may result, accompanied by chill, fever and presence of a large tumor; parts livid and swollen. If prostate involved, may result in death.

Treatment:—Multiple and free incision.

Describe Cowperitis.

Inflammation of Cowper's glands. These glands are anterior to urethra on either side of the perineal raphe, and serve, in health, to lubricate the urethra. There is swelling of the glands, but rarely have retention of urine from the mechanical obstruction. Abscess occurs in 50 per cent. of cases. Treatment:—Rest in bed; aconite, hepar; applications of hot cloths. If this does not have action, and pus formation is announced by chill, etc., operate. The technique is the same as in external urethrotomy. Wash out with bichloride; pack; T bandage. Occasionally fistula may result.

Describe prostatitis.

The two lateral lobes are connected by a little band of muscular

tissue, often called the third lobe. If inflammation in prostate, it encroaches upon the calibre of rectum and urethra. The inflammation may be: (1) Diffuse, (2) follicular. The follicular form has an exaggerated form of posterior urethritis, subjectively, e. g., frequent desire and painful urination, marked pain in perineum. May be diagnosed by finger in rectum. Tender nodules are found over the gland, and in the diffuse form, these are hot and pulsating. Having diagnosed, place patient immediately in bed. Aconite, bell. or hepar. Have favorable termination under ordinary circumstances.

In the diffuse form there is a frequent ineffectual desire for bowel movement. The distention may cause retention of urine, with chill and fever, perhaps mania and death. Results of acute diffuse form may involve the neighboring seminal vesicles. Treatment:—Free incision; wash out and pack; put to bed.

Describe vesiculitis.

Seldom acute, usually subacute or chronic. Symptoms are referred to bladder and perineum; desire to urinate, etc. Try three-glass urine test. (First glass, contents of bladder and urethra; second glass, contents of seminal vesicles; third glass, contents of bladder). Palpate the vesicles by rectal examination. Have patient urinate and examine microscopically.

Describe cystitis.

Inflammation of mucous membrane of bladder as a result of urethritis. Occurs at the trigone. Other coats are never involved. Gonococci do not readily develop on the trigone; however, when they do there are symptoms of posterior urethritis, exaggerated. Diagnosed by three-glass urine test. In cystitis the urine is alkaline; mucin and clap threads are present. In posterior urethritis there are clap threads, with acid urine.

Treatment:—Rest in bed; salol or boric acid to act on urine; Londonderry or Lithia water; hepar. or puls.; auto-intoxication must be prevented by local applications. By catheter run danger of infection. Treat bladder locally with Valentine irrigator, first washing out anterior urethra; then posterior, and finally bladder per se, using a saturated solution of boric acid or 1-20,000 bichloride solution.

Describe ureteritis and pyelitis.

The membrane of the bladder may infect the ureters and so continue to pelvis and calices of kidneys, providing there is mechanical obstruction to outflow of urine. Make a chemical or microscopical examination of urine. Albumin is found in all kidney affections, also granular or hyaline casts. The obstructions may come from stricture or enlarged prostate. Prognosis:—Very grave. Treatment:—Place in bed; try to flush out bladder. Drink large quantities of water; regulate diet, and give internally salol or arseniate of copper (1-100 gr.).

AFFECTIONS OF EXTERNAL ORGANS.

Describe balano-posthitis.

Balanitis is an inflammation of the glans penis.

Posthitis is an inflammation of the mucous membrane of the prepuce. They usually occur together and are due to infection from urethral pus by reason of its caustic action. There is itching, pain; fearful odor; erosions on glans under prepuce, which may cause faulty diagnosis of chancre.

Treatment:—Cleanliness; subpreputial injections of dilute permanganate of potash. After inflammation has left, circumcise.

What is phimosis and paraphimosis?

Phimosis is a narrowing of the preputial opening and occurs in those with a long prepuce. There results an inflammation and impediment to outflow of urine, therefore ballooning of the prepuce at each urination.

Paraphimosis applies to that condition where a tight prepuce has been drawn over the glans and cannot be replaced. The glans penis presents a congested, purple or even gangrenous aspect; behind the corona rises a tense, oedematous, shining collar; back of this a deep sulcus, most marked above, probably ulcerated; in this band lies the stricture. It is very painful and is reduced by forcibly expressing the blood or incising along dorsum and circumcision.

Describe lymphangitis.

Inflammation of lymphatics which line the urinary passage. Symptoms:—Redness, swelling, tenderness along the dorsum; a cord-like sensation on feeling the sides of the penis; almost an erysipelatous condition. Give no internal urethral treatment. Locally, a 25 per cent. solution of ichthyol. Internally, apis or graphites. If pus forms, incise.

What is adenitis or bubo.

Is an inflamed lymphatic gland and is usually found in the inguinal region. Seldom more than single, and usually on left side. Patient feels pain on walking; a chain of lumps is felt in the groin. In twenty-four hours there is a central softening spot, with redness and suppuration. In early stages apply a spica bandage; place in bed; aconite. When pus threatens, hepar. (30x or 200x). When pus appears make an incision from above down, taking care not to injure a vessel; wash and pack with iodoform gauze. With tubercle bacilli present the condition may become chronic.

What is meant by dermatitis medicamentosa?

It is the result of the ingestion of too much cubebs, which serves to disorder the stomach. An erythematous blush appears all over the body. The absence of a primary sore and the marked redness differentiates it from the dark red rash of syphilis; also it disappears rapidly upon stopping cubebs.

What is herpes progenitalis?

Vesicles on the prepuce, apt to be mistaken for chancroid. Result of acute or chronic urethritis.

Describe chronic urethritis or gleet.

The usual course of an attack of acute specific anterior urethritis, poorly treated, is: Acute anterior urethritis, acute posterior urethritis, chronic anterior urethritis, chronic posterior urethritis. The causes in 95 per cent. of all cases are due to a severe attack of acute urethritis, although other causes may be tubercular urethritis, syphilitic urethritis, diminished power of tissues, foreign body, etc. The chronic discharge of the latter may be easily mistaken for gleet. The fossa navicularis, bulb and prostate may be especially liable to chronic congestion on account of the large number of glands present. Stricture may be present in 50 per cent. of all cases of chronic urethritis. Gleet, then, is the chronic muco-purulent discharge from certain inflamed areas of the diseased urethra. After a discharge has persisted 5-6 weeks it becomes chronic (Otis). Symptoms:—The presence of a discharge, profuse or simply a gleety drop in the morning, or strings containing gonococci in the urine. (The presence of strings indicates chronic anterior urethritis). Sometimes illy-defined pains of a neuralgic nature, running into the groin; frequent urination (look at prostate or posterior urethra). Tubercular and syphilitic involvements may confuse. The diagnosis is

assured by the symptoms; two-glass urine test; employment of sounds; endoscope and urethral mensuration.

Give the rule for size of sound needed?

Given a penis three inches in circumference in a state of repose, the urethra should take a 30 French sound; if 3¼ inches, a 32 French; 3½ inches, a 34 French; 3¾ inches, a 36 French, and when 4 inches or more in circumference a 40 French sound may be passed. Therefore, for every ¼ inch in circumference add two to number of sound.

What is meatotomy?

Strictures of the meatus, when congenital, often exist without injurious effects, but sometimes on account of reflex symptoms or to facilitate other treatment their removal may become necessary. As dilatation is impossible, a cutting of the constricture or meatotomy must be performed. The operation may be performed as follows: Cocaine (4 per cent. solution) may be used as a local anaesthetic, but the wound does not heal as kindly after its use and bleeding will be more likely to occur. Grasp and pinch the glans between the thumb and first finger of left hand; hold the knife in the right as you would a penholder; introduce it into canal and cut through the stricture with an easy motion until all resisting tissue is divided. Civiale's meatotome may be used and gauged to the proper size by the Otis urethrometer. The incision is made on the floor of the meatus and is generally made two sizes larger than the normal canal, to compensate for retraction. Haemorrhage, as a rule, is not excessive. A sound should be passed daily for a week and also on the fourteenth day. This treatment applies to all strictures situated within three-fourths of an inch of the meatus.

What is treatment of chronic anterior urethritis?

Prophylaxis:—Rigid treatment of acute attack—Hygiene; diet, medicinal and surgical. The hygienic and dietetic have as their object the obtainance of a bland non-irritating urine. Correct any error of diet; examine urine for phosphates as well as gonococci; give Lithia or Londonderry water; correct any constitutional cause. Medicinal:—Frequently only the well-selected remedy will be needed. Agnus cast, medorrheum, thuja, sulph, nux vom., silicea. High potencies the better. Local:—Pass a sound according to penile mensuration; should be done every third day and afterwards $AgNO_3$, 1-5000 injected. This (a) delays hyperaesthesia, (b) promotes absorption of inflamed and hardened products, (c) expresses contents of diseased follicles and glands. The endoscope is used to locate diseased areas; then an applicator and cotton are used to wipe away pus, and $AgNO_3$ (60 gr. to oz.) or iodine applied. In prolonged chronic cases there is a formation of granulation tissue, and so a resultant stricture, which causes catarrh by pressure. The treatment is the same as in recent cases, with exploration for erosions or strictures.

Give treatment of stricture.

Stricture is a diminution in calibre of the urethral canal, associated with tissue change in the walls. Any constriction above 15 (French scale) is a stricture of large calibre; any below 15 is a stricture of small calibre. The symptoms of a large calibre stricture are those of a chronic urethritis—pain, discharge, frequent urination. etc. Urethral mensuration is the only means of determining stricture. Accomplished by employment of an Otis urethrometer and 4 per cent. cocaine. Remember the physiological narrowing 2½ inches from meatus. Having located the stricture, treat by:—Passage of sound, increasing in size daily. Use of Banks' dilator, and urethrotomy. Urethrotomy fatal in one in fifty. Give salol in 10-gr. doses three times per diem for three

days before the operation. On day of operation give an urethral injection of bichloride (1-1000). Use strict asepsis; inject olive oil and use Otis urethrotome. Do not cut too many strictures at one time. Pass sound daily afterwards. Not always a cure; a deep ulcer may require treatment. Under good treatment, with no deep cause, the prognosis is good.

Describe chronic posterior urethritis.

Usually caused by acute posterior urethritis or excesses. A chronic inflammation referrable to either urinary, sexual or nervous systems. Rheumatism or gout are sometimes etiological factors. There is a variety due to gonorrhoea as the most prolific cause; also a variety from misuse of the organs, from a prolonged irritation of the nerve filaments, which results in a disturbance in the central nervous system. May have hyperaemia, swelling or serous infiltration, and even sclerosed tissue or areas of erosion or ulceration. Chronic epididymitis or folliculitis may occur; sometimes blocking of prostate ducts and consequently retention cysts and chronic follicular prostatitis. Prostatorrhea is recognized by discharge of a milky-white glairy fluid during urination or defecation. The most important changes occur in the region of the caput or veru montanum. A thickening of the membrane, with discharge from the meatus (use two-glass urine test). As result of inflammation, as the urine trickles down, there is a never-get-done feeling, especially in acute attacks. Weight and tenderness in perineum. At times difficulty in walking. Hypochondriasis may be result of masturbation, ungratified sexual desire or excesses. The latter is purely a neurasthenic condition.

Give treatments of chronic posterior urethritis.

Gonorrhoeal Form:—Hygiene; well regulated exercise (sexual and bodily). Care to diet. Irrigate with bichloride (1-20,000), silver nitrate (1-5000), copper sulphate or permanganate (1-5000). At same time having patient urinate and breathe deeply to overcome the detrusor resistance. Irrigate every morning, in absence of contra-indications, and if case is uncured in one month, resort to endoscopy and occasional touching with $AgNO_3$ (60 gr.-oz.). Where thus incurable look for cause in other organs.

Neurasthenic Form:—Moral influences should be advanced. A full-sized Thompson sound should be passed entirely into the bladder. Instill a few drops of $AgNO_3$ (20-30 gr.-oz.) on posterior urethra, causing an acute attack, soon passing off. Cold water bathing; massage; milking of prostatic duces per rectum. A fountain syringe at height of four feet attached to a return flow catheter is used for cold water irrigation. Remedies:—Phos. (change in structures), phosphoric acid (nervous symptoms), selineum (atrophy), chloride of gold (despondency), cantharis (tenderness and discharge of blood, ars. and iron (tonics).

What are complications of chronic posterior urethritis?

Frequently the prostate, seminal vesicles and epididymis become involved. Spermatorrhea is an important symptom of chronic seminal vesiculitis; true or false form. True spermatorrhea, or pollution, consists of an ejaculatory discharge of seminal fluid, with some orgasm, occurring at night or during the day, from concentration of mind on the organs. False spermatorrhea is discharge of viscid glairy fluid, with few or no spermatozoa, without carnal excitement. Treatment: Only a rigid course of hygiene, diet, exercise and even surgery can cure. Operation of Kraske: Enucleation of vesicles, in the true form. Fuller's method: Milk the vesicles per rectum, in the false form.

Describe chronic epididymitis.

A nodule appears in the globus minor; engorgement of the duct and sterility may result. Double chronic epididymitis is a serious condition. AgNO3 is injected into the posterior urethra, thus attempting to reach the duct. Enucleation is required in severe cases.

Describe chronic cystitis.

Rarely occurs as an idiopathic disease, but usually secondary to some other lesion. It may be the sequel of stricture of the urethra, diseases of prostate, growths of various kinds which interfere with the normal exit of the urine, but more commonly is from contiguity of acute gonorrhea in urethral tract. The best and most satisfactory results are obtained from washing out the bladder with a Marcy double current catheter.

Describe chronic Cowperitis.

Chronic involvement of Cowper's glands. May cause a chronic urethral discharge. Is treated as acute posterior urethritis.

What is chronic balano-posthitis?

The smegma bacilli may linger and provoke a discharge. Is treated by circumcision.

Describe venereal warts.

Usually are condylomata or warts which are papillary epithelial outgrowths and are very vascular. They are located most frequently in the fossa behind the glans penis, but may appear on the glans itself, the prepuce, in the urethra, on the scrotum, around the anus, as well as on the labia of the pregnant female, in fact on any part of the external genitals. They may be broad and flat, arranged like a cock's comb or pedunculated, single or multiple, and bathed in a fetid purulent discharge. Treatment: Immediate removal; enucleation.

GONORRHEA IN THE FEMALE.

Describe gonorrhea in female.

It has but one cause, the gonococcus of Neisser. It is seldom distinguished from leucorrhea, therefore apt to become subacute and chronic before treatment is initiated. The disease usually involves the vulva, vagina, cervix uteri and generally the urethra. If not checked it may extend to the body of the uterus. Fallopian tubes, ovaries, etc., from which originate many of the disorders of the female pelvic organs. Symptoms in acute stage last one to two weeks, then becomes subacute or chronic. Liable to persist with symptoms of other organs exaggerated. The vagina is the seat of infection in most cases, the disease constituting a vaginitis.

Describe vaginitis.

Inflammation of vagina, having a profuse greenish-yellow discharge. Treatment: Same as gonorrhea in male. Prophylaxis: Saturated solution of boric acid: irrigation morning and evening with permanganate.

Describe urethritis in female.

The same symptoms occur as in the male, also complications of stricture and folliculitis. There is burning on urination; meatus swollen and red; perhaps a little blood oozing. Apt to become chronic. Endoscopy may be employed or the discharge obtained by finger pressure. Treatment: Same as urethritis in the male.

What is Bartholinitis?

Inflammation of Batholini's glands. Very frequent complication and usually results in formation of abscesses. The duct may become occluded and a cyst form, which ruptures spontaneously with stinking pus.

What is vulvitis?

Inflammation of vulva. The labia majora mostly affected. Ninety per cent. of all cases are in little girls, who may become infected through carelessness on the part of their elders, by means of infected towels, etc. Not very serious, having no tendency to spread. Symptoms: Redness, swelling, itching, a discharge which produces an eczematous excoriation on the thighs. Treatment: Dusting of thighs with subnitrate of bismuth or cornstarch; washing of vulva with permanganate or saturated solution boric acid.

Describe the infections of uterus.

The cervix, body or tubes may be inflamed, singly or combined, either acute or chronic. In acute inflammation of the cervix there is a discharge; if severe, erosions; if displacement, friction may cause erosions. In chronic form is very hard to differentiate from leuchorrhea. Treatment: Must apply something non-irritating, such as glycerite of tannin. In chronic, use a dull curette and wash with a weak solution of $AgNO_3$, pack with gauze and drain.

What are the complications of gonorrhea in female?

Condylomata, the most frequent, especially about the anus. Treat as in male. Bubo occurs more often than in the male. Cystitis may occur, yet comparatively seldom.

Describe gonorrhea of rectum and anus.

Rare. In female may occur from contact of vulval fluids. Contracted in both sexes from pederasty. Has a distinct period of incubation; then inflammation and difficult defecation; profuse discharge; lumbar distress; dyspepiic symptoms on account of fecal retention. Rarely extends beyond the internal sphincter. Treatment: Irrigate with permanganate; use speculum and in the chronic form apply $AgNO_3$.

What other complications may be had from gonorrhea?

Gonorrheal ophthalmia, rheumatism and gonorrhea of mouth.

CHANCROID.

What is a chancroid?

This is a contagious, virulent ulcer which (when uncomplicated) is never followed by constitutional symptoms. It is incorrectly called "soft chancre" by the laity. Usually found on the genitals of those unclean by nature and habits. They are both hetero and auto-inoculable; crop after crop of chancroids have been developed upon the same individual. The lesions vary in size from a pin head to a dinner plate. They are usually many in number, while in chancre always single. A chancroid does not give immunity from future infection. Not met with in private practice to as great an extent as "chancre," the initial sore of syphilis. They can only result from the direct application, accidental or premeditated, of chancroidal pus to the skin or abraded mucous membrane, one pus corpuscle being sufficient to give rise to the characteristic lesion. It cannot be produced by syphilitic virus, by poison of any kind, or the germs or pus of any other disease. That it is due to a micro-organism (yet undiscovered) is proven by the fact that, (a) it is inoculable to the one hundredth generation; (b) only de

stroyed by the most irritating drugs and high degrees of heat; (c) can live hermetically sealed indefinitely.

What are the different forms of chancroid?

(1) Follicular. The virus enters by a follicle. (2) Herpetic. A serous infiltration of papules. Distinguished from herpes preputialis by inoculation test. (3) Diphtheritic. A very frequent form; a sanious foul-smelling exudate; covered with a grayish "wet-soap" membrane, about size of little finger nail; ulcer, not clean, but ragged on its edge. This is the most typical type. (4) Ecthymatous, where laminated crusts form on a follicular or herpetic variety of lesion. (5) Ulcus elevatum. Liable to be confused with an initial lesion of syphilis. But lacks history and time required for chancre. (6) Inflamed type. Has a marked degree of peripheral hardening. (7) Phagedenic. Usually chronic. There are constitutional symptoms; frequently caused by a weakened constitution or poor treatment. The phagedenic form may occur in one place and gangrenous in another. (8) Gangrene. Has usual symptoms of gangrene. (9) Serpiginous. A crawling, spreading form; acute and malignant. Process usually commences as an acute diphtheroid chancroid; may be very severe.

How is auto-inoculation practiced?

A favorable site is selected, where it is not liable to spread, usually about the nipple. Thoroughly scrub and render part aseptic, make an abrasion with a clean knife and rub virus well in. Cover with a watch glass and bandage. If a chancroid, a papular vesicle forms in twenty-four hours. In twelve hours later ruptures and a purulent discharge oozes out.

Differentiate chancroid from chancre.

CHANCROID.	CHANCRE.
Not clean cut.	Clean cut.
Not papular.	Papular.
Vesicular or pustular.	Not vesicular or pustular.
Painful.	Painless.
No period of incubation.	Average incubation of 21 days.
No constitutional symptoms.	Always followed by constitutional symptoms.

Differentiate chancroid from herpes.

Chancroid is perpetually inoculable. Herpes non-inoculable beyond third generation.

What are the complications of chancroid?

(1) Lymphangitis. Not different from that produced by gonorrhea. (2) Sloughing and gangrene. From some micro-organism; has all acute inflammatory symptoms; process going on to necrosis, caused by inappropriate or careless treatment. (3) Lymphadenitis or bubo. That occurring from chancroid is known as "virulent" or "absorption bubo." When it occurs and is well established suppuration is inevitable. Both auto and hetero-inoculable.

Give the types of bubo, irrespective of chancroid?

(1) Simple or traumatic. Caused by blow on groin, stubbing toe, etc. (2) Gonorrheal. Usually one side only affected. (Refer to gonorrhea.) Symptoms: Pain, tenderness, swelling, difficulty in walking, formation of pus. (3) Syphilitic. Characteristic, always occurs in pairs; do not suppurate; painless; persist in spite of all treatment. (4) Tubercular. caused by a tuberculous infection of the glands; grow to enormous size; very painful; are liable to break down.

What is the treatment of chancroid?

(1) Prophylaxis. Cleanliness and continence. (2) Abortive. Wherever suspect chancroidal infection immerse the organ, within six hours, in a concentrated solution of citric acid; fuming nitric acid may be used; at times may employ the knife. This is severe in view of mildness of chancroid, and bubo may follow. (3) Constitutional. For chronic gangrenous and phagedenic types, use tonics; codliver oil, wine. Give a good, generous diet. (4) Medicinal. KI. (50-100 grs.), daily, acting as an eliminative and tonic, also a reconstructive. If not borne well, iodide of sodium or starch, lachesis, sulph. silicea, bacillinum or potassium (high potency). (5). Local. Is always employed. (a) Lotions: Cleanly and antiseptic, may or may not be cauterizing. Carbolic acid (1-40), bichloride (1-2000). CuSO4 (10 per cent.), dilute zinc chloride; lead water and laudanum; dilute AgNO3; lotio niger. (b) Cauteries. Destroying at once the virus and preventing complications. At times needless. Very painful. (Are used in cases, who will not follow physician's advice; where spreading and threatening complications.) Concentrated nitric acid, stick AgNO3, actual wire cautery. To apply this, scrub the parts; apply peroxide of hydrogen, then cocaine (10 per cent.), cauterize, wash with bichloride, apply wet bichloride cloths, bandage and dress daily. About the third day a crust forms, with a healthy granulating surface beneath, stimulate with AgNO3 (40 gr. to oz.). (c) Dressings. Dry ones of little value except in after treatment, when cornstarch, iodoform, aristol or acetanilin may be used. Water allays inflammation and gives comfort. Iodine, bromine water, bichloride, AgNO3 also good. (d) Baths. A hot sitz bath usually causes stoppage of destruction if lesion goes on to phagedena. (3) Surgical Curettage or excision of entire area; curettage is of little avail.

What is treatment of chancroidal complications?

Extensive inflammation: Acon., hepar. bell., antispsis, baths. Sloughing: Excision. Gangrene: An attempt to get a healthy line of demarcation. Phinosis: Must be reduced to inspect for possible presence of a chancroid or chancre. Entire glans may be eaten away and a urinary fistula result. Inject permanganate thoroughly; give apis (30 x) for oedema of prepuce. If no results. operate. Infection invariably occurs and a cauterization is necessary. Do not attempt to suture, wrap in a wet compress. The measure usually must be repeated many times. Pharaphimosis. Must be reduced mechanically or surgically, no remedies avail. Etherize and reduce by pushing glans in with both thumbs, then circumcise. If irreducible, express blood from glans by a rubber bandage or make multiple incisions, shave parts and cut the ring with long-bladed knife. Bubo. Prophylaxis, cautery, put patient at once in bed; open bowels; apply pressure by shot bag or bandage. Internally, acon., arn., bell., hepar. Where pus is detected treat by (1) a medicament carried directly to focus of inflammation, make punctures with a knife; aspirate pus; syringe; repeat; inject peroxide of hydrogen gently, iodoform emulsion; pack bandage. (2) Incise and curette, having washed with peroxide and bichloride. Apply wet bichloride gauze; give hepar subsequently. (3) Removal of the gland before suppuration is advisable in many cases.

SYPHILIS.

Describe syphilis.

Is a constitutional disease, congenital or acquired. Chronic in its course, affecting at the same time any or all tissues of the body. Prone to acute exacerbations and relapses. Fatigue and excesses of all kinds

tend to increase its manifestations. It is more prone to exhibit marked secondary and tertiary symptoms in the intemperate and in early life, and in those of scrofulous or gouty diathesis, one attack usually affords protection for life, yet there are cases on record of second invasions. The germ of the acquired form is as yet undiscovered. The original cause is the introduction into the system of syphilitic virus, either by inoculation or by inheritance from father, mother or both. Specific inoculation only occurs when the epidermis or the epithelium of the mucous membrane has been removed. Therefore inoculation depends upon (1) The pathological secretion; (2) abrasion of any part of body. Infection may be immediate (from intercourse or bestiality, kissing, etc.,), or mediate (from towels, pipes, etc.).

What is a chancre?

It is the initial sclerosis of syphilis. Occurs at the site of abrasion and after the first period of incubation (2-120 days, average 21 days after infection). It is diagnosed by (1) the distinct period of incubation; (2) the presence of a hard, indurated base, and (3) associated glandular enlargements of lympathics near the point of lesion. They may appear on any part of the body, frequently upon the lips, tonsils, face, fingers, nipples and anus, but principally on or around the genitals, especially at the coronal sulcus. Seldom more than one. while chancroids are usually multiple. Chancres seldom leave scars. They persist until rash occurs, showing a constitutional involvement.

What are the several types of chancre lesion?

Erosion usually on the preputial orifice. Is a simple denudation of epithelium underlaid with a small induration—colored pink or grayish. Found on mucous or muco-cutaneous surfaces. Three-fourths of all chancres are of this variety.

Papule:—A dry, scaly lesion, from a pea to a walnut in size. Undergoes no resolution. Is the form which appears on the skin surfaces or dry part of mucous membrane. Sometimes slightly elevated and deep wine-red in color. After a few days it becomes covered with a scaly crust, which in time drops off. If exposed to moisture erosion will take place.

Ulcer:—When the vitality of the patient is at a low ebb, and the chancre has been irritated or inflamed, ulceration will occur, developing a condition of granulation or a fully developed "Hunterian" chancre, its hard, woody and elastic induration extending far beyond its edge. The (a) superficial ulcer is practically an exaggerated erosion; the (b) deep or "Hunterian" have adherent edges (never undermined), which slope down into the induration at the centre, giving a funnel-like aspect, as occurs in no other form of ulceration. In contour they are round or oval; the base is often grayish, discharging a sero-purulent fluid. These are accompanied by swelling in the inguinal glands.

Mixed Chancre:—Chancroid and chancre is same lesion. Neither are as severe as when existing separately.

Differentiate chancre.

Chancroid has no distinct period of incubation; no induration; no multiple ganglionic enlargement.

Herpes:—Multiple; vesicular; repeated, and no ganglionic enlargement; no period of incubation.

Epithelioma:—No period of incubation; history of lesion being present for some period of time.

Condylomata or Verruca:—Multiple; vesicular; bleeding easily; crusted; exude a foul pus.

Acute balanitis:—Many small denuded spots. History.

Psoriasis:—Apt to be confounded with dry, scaly papular chancre. Diagnose by history.

What is the treatment of chancre?

The old idea that syphilis is incurable is fallacious. The disease is as curable as any other infectious disorder, provided treatment is conscientiously carried out.

Prophylaxis:—Before sexual intercourse anoint penis with olive oil. In making vaginal examinations use care that hands are lubricated with olive oil. Good hygienic conditions must be insisted upon. Alcohol in excess must be discontinued. Decayed and irregular teeth should receive proper attention. The chancre should never be cauterized, but should be dusted with iodoform, aristol, calomel or subnitrate of bismuth. Give mercury internally in large doses for the ulcerative form. Lotio niger ("merc. oxid. nig.") in water locally on cotton allays irritation, then apply acetanilin or any drying powder. If very large, enucleate, yet this will not cure the disease per se. Chancres in women respond more slowly to treatment. Use cleanliness, antisepsis and push mercury.

Give the old classification of syphilis.

Primary:—Period of first incubation or that intervening between the exposure to contagion and the appearance of the chancre, on an average about 21 days. The chancre per se. A cutaneous blush; swelling of inguinal glands. After a second 21 days becomes

Secondary:—From 40th-45th day to 3d year. Lesions of mouth, hair, nails, bones, etc., appear; also syphilides of the skin and mucous membranes (mucous patches, roseola, papules, pustules, etc.). This lasts for 2-3 years and ending in complete recovery or in

Tertiary:—The duration of this period is unlimited, either goes on to cure or death. All the destructive lesions (tuberculo-ulcerous syphilides, periostitis, osteitis, gummata, etc.). The separation of syphilis into periods is, to a certain extent, artificial, but it corresponds, however, to the course of most cases and is desirable for purposes of dogmatic descriptions. Yet the above classification is not to be recommended, as 60 per cent. of all cases do not reach the last stage. Some cases have only a chancre; others a chancre plus inguinal swelling; still others the blush only. Heredity, predisposition, etc., influence the severity or mildness of above stages. The majority contract syphilis in middle life, when the vital strength tends to throw it off. Youth and old age are not calculated to resist it well. By proper medicines malignant types may be converted into benign. Habitual smokers or drinkers are apt to have a severe form, as are those of a strumous or rachitic tendency.

Give later classification of syphilis.

1. A mild form:—Period of incubation, average 21 days; then a chancre, followed by nodules and nothing else. Not fatal if treated properly.

2. Mild form with superficial lesions:—In addition to chancre and adenopathy, there is some type of syphiloderm present. Not a serious form, but annoying. This class covers 60 per cent. of all attacks.

3. Malignant syphilis:—Assumes gummatous or tuberculo-ulcerative type. By careful hygiene, etc., can be converted into second type.

4. Malignant syphilis with profound symptoms resisting medication and widely destructive. Resists all methods of treatment. A very grave type and fortunately seldom seen. Chancre, blush, ulcerative lesions in mouth, rapid destruction of nares and soft palate: gummata at brain or iris; paraplegia, etc., etc.

Give the course of a syphilitic attack.

After noticing the chancre the patient becomes alarmed. A chloro-anaemic or icteric condition is developed, characterized by mental depression, listlessness, indifference, dyspnoea, physical weakness, sallow skin and sunken eyes. The normal lustre of the hair disappears; hairs break at the roots. There is agonizing headache, worse at night; breath is foul; pleuritic or abdominal pains. The general weakness and malaise

may be confused with incipient typhoid. The lymphatic system is the first to be profoundly affected; swelling of inguinal glands; by absorbing the virus, later, all the lymph spaces enlarge, varying in size from a pea to an egg; painful or painless; the lesions never suppurate unless there is infection from the staphylococcus (mixed type). The blood is anaemic; syphilitic cachexia, increase of leucocytes, thus accounting for the profound malaise. This is followed by the various skin lesions.

Give the characteristics of various skin lesions.

They may simulate acne, variola, varicella or purpura. A "syphilodermata" is an early syphilitic lesion. While a "syphilodermata" is a later lesion. When still later and destructive features are present they are called "syphilodoma." The characteristics of syphilitic skin lesions are (1) symmetry, both sides involved alike; (2) bilateral grouping; (3) color depends upon degree of congestion, race and complexion, usually ham-colored or grayish; (4) polymorphic, a rash, scaly patch or papule may exist on different parts of the body at the same time. If early, on both sides alike; if late, on one side only. (5) Absence of subjective symptoms; no pain; no itching. If present, are result of improper treatment. (6) Tendency to recur. (7) Persistent type of annoying lesions. (8) Tendency to evolution. In the mixed type the macule may become a papule, which swells to a vesicle, which suppurates into a pustule, which in turn ruptures and forms a crust. A papule is prone to form vesicles and go on to crust formation. A tubercle may become an ulcer, etc.

Give classification of sypilodermas.

1. Erythematous.
   (a) Macular:—Mild, little disfigurement; should yield to treatment.
   (b) Maculo-papular.
2. Papular.

Mild syphilis, with persistent lesions. (a) Miliary; (b) lenticular; (c) moist; (d) dry.

3. Pustular.
   (a)Pustulo-crustaceous (ecthymatous).
   (b) Variolar or Varicellar.
   (c) Acne.
   (d) Impetigo.
   (e) Rupial.
4. Tubercular.
   (a) Tuberculo-gummatous—a grave type.
5. Extravasions.
   (a) Pigmentary; (b) haemorrhagic.

Describe the erythematous syphiloderm.

Are a very important class, as they classically represent the earliest manifestations of syphilis. They are the most benign and disappear most promptly under treatment. Usually the first manifestation, though it may be a feature of other lesions, as papular, etc. Because of its simplicity and symmetry is called "syphilitic roseola." It appears about forty-five days after chancre. May first appear on abdomen. Can be delayed by mercury internally. The eruption develops unnoticed or rapidly, from a hot bath, chilling of the surface or excitement, physical exercise, such as boxing or dancing. Usually disappears in 7-10 days; may be confined to buttocks, abdomen, brow and cheeks, while, again, the whole body may be affected.

Describe the two types of erythematous syphitoderm.

1. Macular: Skin stands out prominently in lesions, not elevated; may be a bright red of congestion, pink or brown, and finally fade away. Usually oval in shape; are unaccompanied by any subjective symptoms.

2. Maculo-Papular: Mixed type and apt to become chronic. Usually

on brow and at junction of nose with the cheeks. Are elevations of skin, with elevated central spots. Represents greater degree of congestion than macular. May be confused with scarlatina, which has slighter sore throat, lower temperature, no profound systemic depression, no history of sore or ganglionic involvement, thus differentiated. Distinguished from measles by its lack of squamous branny lesions.

Describe the papular syphiloderma.

Usually a manifestation of the second stage and appear in about eight weeks after the original lesion. They remain from three weeks to two months, accompanying or following the erythematous form. Papules appear over the entire body or limited to hands, feet or brow. May simulate keratoses, are either mild or malignant. If large elevations and pus formation; may result in tubercle, ulcer, etc. There are four especial types.

Describe the four types of papular syphiloderm.

1. Miliary: Rarest papular variety. Have very minute pin-head lesions with branny feel over entire body. Occasionally may develop a small vesicle or crust at the top.

2. Lenticular: Most frequent manifestation, may be of any size or number; vary in color according to degree of congestion from bright red to pigmentations of different shades. Appear in 4-5 months or secondary at 4-5 years. They finally heal leaving no scar, unless irritated.

3. Papulo-squamous (dry) on margin of scalp, inside ears; on palms or soles; moderate sized elevations with dirty grayish scales or crusts formed at top. This condition must not be confused with seborrheic eczema or psoriasis. Seborrheic eczema seldom has papullation, but profuse white scales over the whole scalp and great itching. Psoriasis has heaped up white mother-of-pearl scales and bleeds easily. Neither has history of syphilitic sore.

4. "Mucous Patch" or moist papule. Very important because most contagious of all varieties. While the lenticular type is characteristic of syphiloderma, yet the "moist type" is by far the most important. Is very chronic and prone to relapses. Very frequently is offensive particularly if at outlets of body. Differs from a squamous patch in catarrhal infiltration of the epiderm. Arises from irritation of papulo-squamous variety. Does not respond kindly to mercury (may be much aggravated). Best results reached by local applications. A papulo-ulcerated syphiloderm may occur from irritation.

Describe the pustular syphiloderma.

While not as frequent as the preceding skin lesions, are often associated with them. They are usually, primarily, papular, but become pustular from want of cleanliness, use of mercury by inunction, friction of clothing, etc., especially in cachectic tubercular individuals. May be early or late in their appearance, persistent or transitory, arranged in groups or isolated and scattered over the body. May be combined to form a papulo-pustulo-vesiculo syphiloderm.

Describe the several types of pustular syphiloderm.

1. Varicellar Type: The simplest pustular formation. The lesions are usually vesicular. They appear in groups associated with a slight fever. Usually on the face, yet at times on the abdomen. True varicella or chicken-pox has a higher fever, vesicles in mouth and on palate disappear rapidly; occurs usually in children and lacks history of chancre.

2. Variolar Type: An exaggerated form. Important to diagnose from non-haemorrhagic small-pox. In the latter have a spotty feel, depressed centre, high temperature with a sudden fall.

3. Acne Type: Usually differentiated by history. Is as much a papule as a pustule in its structure and evolution.

4. Impetiginous Type: Characterized by minute pustules. May be confused with impetigo non-contagiosa or acne vulgaris or pustulosa. A pustulated apex in impetigo; whole lesion in acne. Simple impetigo not inoculable.

5. Ecthymatous Type: Papule upon which is vesicle, this ruptures and have crust formation.

6. Rupial Type: Primarily an impetiginous form surrounded by an inflammatory zone. Also have the presence of a pustule which ruptures and forms crusts, but the pus spreads circumferentially and new lesions form, coalescing with the former; may be black or greenish from haemorrhage. Is very contagious. May become serpiginous. Upon healing usually leaves a scar. Is more often a manifestation of the tertiary stage.

Describe the tubercular syphiloderm.

Is an exaggerated papular type, including gummata. Tubercles are nodular, movable and do not take in deeper skin layers. The gumma affects any deep tissue. Tubercular lesions are a late manifestation of syphilis usually on chin, legs and bends of joints. Includes about one-quarter of all late lesions; usually making their appearance three of four years after the chancre.

Tell of the different types of tubercular syphiloderm.

1. Dry: Exaggerated papules with some desquamation. They disappear by absorption. When they appear early they are malignant.

2. Ulcerative: Appear from lack of cleanliness, etc. Are ragged ulcers, very chronic in their nature, very contagious and respond only to local applications. May be differentiated from a lupus. When on nose, by lupus being unilateral and chronic; in syphilis a very rapid growth. Differentiated from acne rosacea by acne having dilated capillaries. Sycosis has involved hair follicles with a papulo-pustule at base. Epithelioma is a disease of aged, slow in course and superficial.

3. Gummata: A circumscribed nodular subcutaneous growth on periosteum, bone or muscle; occurs usually three or four years after chancre, but occasionally as late as fourth or seventh year. The lesion is usually single and about the size of a marble. Three stages are noted: (a) Stage of formation; movable tumors under the skin. (b) Stage of inflammation or ulceration. Tumor raised somewhat, becomes shiny, oedematous, breaks down and suppurates. (c) Stage of resolution; fluid gummy cicatrix forms. A gumma may pass the three stages in one month. May occur in successive crops. Marked deformity may be result. Gumma shows a preference for lower third of leg; varicose ulcers are located higher up, surrounded by eczema marked itching and differentiated by history.

Describe the types of extravasated syphiloderms.

1. Pigmentary: A fading maculo-papular type. Redness, then brownish. May be an independent eruption. As a rule do not find lesions upon face or brow. Tinea versicolor has epidermal involvement and pigmentation of deeper tissues and usually appears on the face.

2. Haemorrhagic: Is never a distinct eruption. Due to marked congestion in any skin lesion of syphilis. Purpura haemorrhagica tends to recur.

What characteristics may any syphilitic lesion assume?

1. Serpigmous: (a) Superficial, (b) Deep.

2. Vegetative: An hypertrophy of papillae, usually ocurring in moist regions, as on anus, prepuce in axilla or the folds of the mammae.

How does syphilis affect the hair?

The hair in any part of the body may be attacked, but more especially that of the scalp, face, eyebrows and eyelids. The hair becomes dry and lustreless, the bulbs distorted and mis-shapen and co-incident with a cutaneous eruption there is a denudation. Alopecia usually appears about three or four months after chancre and may be the only diagnostic point of syphilis. Two varieties:

1. Alopecia solely from syphilitic virus. At the third month the hair comes out painlessly; areas of denudation of any size are formed. The eyebrows, beard, axilla or pubes may be envolved singly or all at once. After the virus has expended its force new hairs form where follicles are not destroyed.

2. Alopecia from syphilitic virus plus a scalp lesion. An ulcerative lesion may eat deeply, destroying the follicles, hence baldness not due to syphilis may occur; appearing first at temporal and frontal regions. Alopecia may be due to nervous causes, as fright; or premature grayness. Alopecia caused by ringworm has a coppery zone outlining the area of denudation, disappearing on application of iodine. Alopecia may result from seborrhea sicca or "dandruff;" from improper care of diet. The follicles are blocked and dust collects. irritating and destroying the follicles; causing a secondary alopecia. It may also be a sequel to psoriasis. In any form if the follicles are not destroyed the hair will grow again without treatment.

What is the effect of syphilis upon the nails?

Diseases of the nails and adjacent parts occur in the latter part of the secondary and during the tertiary stage. They may be mild or severe in form, of long or short duration, but are noted for their persistency. Wherever there is an alopecia, there is always a nail lesion. Some divide the disease into classes, calling it "onychia" when it begins in the nail per se and may extend to surrounding parts, and "paronychia" when it commences in the tissue around the nail and may involve the nail. 1. Paronychia syphilitica occurs about third month after initial sore (a) superficial when a fissure alone is formed, (b) deep; a hardened nodule, reminding one of a tubercle. As a result of irritation ulceration follows, with an enormously swollen terminal phalanx and occasionally a very offensive discharge. 2. Onychia Syphilitica; (a) Atrophic, vitiligo or leucoderma; nail loses its lustre; has a yellow hue; small minus pigment, brittle, (b) Hypertrophic: Nail is club-shaped, superimposed layers. (c) Separation: Nail is shed; a new nail forms. Either straight or crooked. When nail involvement occurs late, it is commonly due to a cachectic condition of the system.

How does syphilis affect the mouth and tongue?

Commonly results of heredity. The lesions may occur early or late and are source of much contagion through kissing, smoking, etc. The chancre may be on the tongue or lip, and usually erosive when at the latter location. These lesions are quite apt to be obstinate to treatment. The late manifestations are usually co-incident with and similar to skin lesions. The history is, that about seven weeks after initial chancres a macular or erythemato-macular eruption occurs in the mouth. These may remain superficial or through irritation result in an ulcerative form. Later the papular type follows, i. e., the moist variety or mucous patch which are usually situated about the angles of mouth, tip of tongue, margins of gums, or on uvula or its arches. Seldom single, usually five or six. Are painful, persistent and annoying. An enlarged mouth papule is called a tubercle or nodule. When irritated, tuberculo-ulcerative. Scales are very rare, but at times a feature of late lesions. Fissures are pathognomonic of hereditary syphilis, usually a the angles of the lips. The early mouth lesions are superficial. The late, deep and highly destructive. Gummata appear commonly on the

tongue or uvula. "Leucoplasia Oris" or smoker's patch will appear in a variety of diseases. Mucous patch similates the lesions of acute stomatitis. Herpes labialis, has yellow bases (syphilis, erythematous) and persists much longer.

What of sypnilis of the teeth?

Syphilis of the teeth has its chief interest from its very important bearing on diagnosis. Manifesting itself at an age when the child is not apt to present active or unmistakable cutaneous and mucous lesions of the disease, the recogrition of which is .nerefore often extremely difficult, this diagnostic point is greatly increased. The special expression is to be found only in the permanent upper median incisors. These teeth are stunted, abnormally narrow at the cutting edge, crescentically rounded with the convexity upward, and the surface inclined upward and forward instead of backward, as in normal teeth, widely separated, but converging at their lower edges. They are generally known as "Hutchinson's teeth" and are pathognomonic of hereditary syphilis.

Describe syphilis of respiratory tract?

Is of great surgical importance on account of its relation to larynx, where it may simulate carcinoma or tubercle. Syphilis of the nose is very common. Lesion with swelling of preaural and mental glands. Often accompanied by chronic atrophic rhinitis. Syphilitic ozena has a characteristic foul odor. A gumma may destroy the nasal bones and cause a sinking in of bridge, more often in hereditary form. The pharynx sometimes affected early in the disease, but only late lesions tend to destruction. The larynx may be early involved, difficult to diagnose without instruments, yet of course the voice and respiration are abnormal. Differentiated from laryngeal tuberculosis, which has fever, cough, dyspnoea and associated lung changes. Microscopic examination conclusive. Syphilitic changes in trachea and bronchi are commonly studied post-mortem.

How does syphilis affect the bones.

Osseous syphilis is met with during any of the periods of the malady. May be either hereditary or acquired. The determining cause of the osseous lesion and of its seat, is generally some form of traumatism, which is usually slight, but frequently repeated at the same point. It is owing to this fact that the superficial bones, as the frontal bone, clavicle, sternum, radius and tibia are the most common seats of the disease. In cases of infantile syphilis, the active development of the bones sufficiently accounts for the localization of the disease. Any one part of the bone may be attacked, e. g., periosteum, medullary substance or bone per se. In the acute type there is pain, but not of a persistent character. In the late stages the symptoms are distressing, due to gummatous formation. Boring pains, worse at night and from contact with any substance, patient constantly shifts position (Mezereum 30x). Too much mercury may cause bone pains. When the the shaft of the tibia, frequently forming a deep bone ulceration. Differentiated by the history from articular rheumatism and from "erythema nodosum" which is not serious and disappears rapidly after treatment and has no history of syphilis.

What is syphilitic dactylitis?

Is an inflammation of small joints of fingers or toes due to syphilitic infection and involves chiefly the periosteum and the fibrous and integumentary tissues surrounding a joint. It is characterized by slow, almost painless club-shaped swelling and discoloration of the affected member. Usually at second joint of phalanges and is always due to a

gumma. Differentiated from a felon which affects the entire finger, is more common on palmar surface and rapidly forms pus.

What are the lesions of the large joints, muscles and tendons?

The larger joints, especially of shoulder and elbow may be attacked. There is great pain and impairment of function. In late syphilis the bursae are commonly affected, especially those at the knee joint. The tendons and their sheaths are often involved with agglutination and considerable pain. Secondarily the aponeuroses may be the seat of syphilis. Syphilis of the muscles may be early or late, acquired or hereditary. Accompanied by great pain and in the late lesions destruction and atrophy.

What of syphilis affecting heart and gastro-intestinal tract?

Post-mortems have shown pericarditis and myocarditis as a result of gummatous deposits of the heart. Arterial sclerosis has occurred. Gastro-intestinal types of syphilis of oesophagus or stomach are rare, yet occasionally at the ano-rectal pouch. In late syphilis the liver may ulcerate and cirrhosis result from a gumma.

Describe syphilis of rectum and anus.

Has a distinct period of incubation. Usually have mucous patches, a rectal stricture may result, which more often arises from syphilis than cancer. Retention of feces gives serious symptoms. High rectal tube is used, no laxatives—KI in large doses.

Describe, in brief, syphilis of the genito-urinary system.

Chancres oftenest appear on the penis; gummatous infiltration may occur. The bladder, prostate, ureters and vesculae do not suffer. A gummatous infiltration of the cord and epididymis may happen. In gonorrheal epididymitis the tail is attacked; in syphilis the head. A gumma of the testicle may be confused with hydrocele and is differentiated by the necessary operation in either case. In early syphilis there may be acute Bright's disease, oedema of eyelids and other characteristic symptoms. May even have chronic 'nterstitial nephritis.

How does syphilis affect the nervous system?

Numerous disturbances of the nervous system occur as the result of the varied pathological changes which take place in and around the nerve centres and trunks from specific growths, ostitis, periostitis, etc. Men are more often subject to its attack than are women. It may be early or late, when early, however, is not as severe. It is said that often the early symptoms are the result of a general toxemia and not of any specific destructive lesion. The late symptoms appear about five years after the chancre, though forty years may intervene at times. These are always due to a gumma, either diffuse or circumscribed. The gumma may lie in the bones, ganglia, large blood vessels or brain itself.

Describe the effects of syphilis upon brain and other nervous tissues.

Where a large gaglion is affected the lesion is in the middle of the cerebrum. There is present a severe headache, which suddenly leaves the patient and have paralysis of the opposite side. Exaggerated reflexes are present. Prognosis, very grave.

In gumma of the brain or meninges the lesion is usually in the cortex. Symptoms: Excruciating headache, worse at night, which drives the patient frantic. Often a facial paralysis, supraorbital neuralgia, disturbance of special senses, as motor and sensory aphasia, smell or taste lost.

In lesions of the medulla there are paralyses of sets of muscles, as of the eye, both arms, both legs, etc.

If syphilis of the cord, the gumma is usually situated in the dorsal

or lumbar vertebrae or in the sacral plexus. Incontinence of urine and feces, great tendency to bed sores, girdle pains, distortion of leg muscles.

Syphilis may cause tabes dorsalis with incoordination, locomotor ataxia and with alcoholism and excessive venery may result in dementia paralytica or paresis. When the peripheral nerves are involved they are treated by resection or KI.

How does syphilis affect the ear?

Syphilis of the ear for obvious reasons is not often discoverable until the patient has reached an age at which interference with the function of hearing becomes a noticeable phenomenon. The only symptom likely to be noticed is a catarrh of the middle ear. This may lead to perforation of the membrana tympani, purulent infiltration of the mastoid cells and involvement of the Eustachian tubes. They are almost always conjoined with retinitis, choroiditis and optic neuritis.

What are its effects on the eye?

The larchymal gland is seldom involved; yet there may occur a stricture of the duct. A chancre may form on the iris, and a chancre, ulceration or gumma on the conjunctiva. Syphilis is the most common cause of interstitial keratitis or inflammation of the cornea. The choroid coat, retina or optic nerve may be involved. If retina, night blindness is the result, if optic nerve, even atrophy. Cataract has occured with syphilis as its cause. However, the most common effect of syphilis upon the eye is upon the iris, may come early or late and be acute, subacute or chronic. The symptoms are deep boring pains, pericorneal injection and a feeble pupillary reaction. It is a very serious complication.

Describe hereditary syphilis.

Lesions in this form are discussed in text-books under separate heads, but only a few conditions presented in early hereditary syphilis require special consideration.

Syphilis of the placenta is of especial interest in its relation to the abortions and still births so frequent in syphilis. Under the influence of the disease proliferation begins in the villi, which are, normally, only sparingly supplied with cells, and extends to the connective-tissue stroma and the epithelium. This proceeds to such an extent that it leads to compression of the vessels, and finally obliterates them. If this process extends over the entire placenta, the foetus perishes before it is complete. If it is limited to circumscribed areas, it may continue to live for a shorter or longer period. It may be transmitted by either parent at the moment of conception, either the spermatozoon or ovum being infected because of the existence of the disease in the parent.

Describe the appearance of syphilitic child through hereditary influences

Makes its appearance at once or soon after bitrh, yet may show no symptoms until the child's tenth year. There are but few lesions present. The child will be restless, feverish and peevish. It does not care to nurse, and diarrhoea or spitting of its food may accompany its first symptom. Irritation of the nasal membrane follows promptly and the child chafes while trying to nurse because of the stoppage of the nostrils by coryza, which irritates and excoriates the nose. Within two or three days after coryza sets in, an erythematous rash appears about the forehead, genitals and thighs. The expression of the face is characteristic, marasmic shrunken skin. Mucous patches in the mouth, nose and larynx, causing the peculiar cry, which is harsh and irritating. There are papulo-squamous syphiloderms on the palms and soles. No syphilitic lesions from the child infect the mother, but may infect another handling the child. The skin is wrinkled, dry and lustreless, of a

sallow or earthy color and drawn over the bony prominences, giving a prematurely aged look to the child. The hair is dry and scanty. These children rarely survive the third month, but some live on or die later of syphilitic gummata or other disease, but if they grow up, are stunted. Dentition is delayed, the permanent teeth presenting the pathognomonic Hutchinson's teeth. The fontanelles are imperfectly closed. The nails may be involved, either onychia or paronchia being present. The bones are oftener attacked in hereditary than acquired syphilis; the skull tibia, scapula and sternum most frequent. The tibia has the "Sabre blade" deformity, a bowing somewhat forward. Differentiated from rachitis by the "rachitic rosary." May have a hydrocephalic skull or dactylitis in small joints. Syphilis, when it attacks the lungs, always consolidates the middle lobe; while catarrhal pneumonia affects the apices.

The mouth, stomach, infestines, spleen or kidneys may be affected. A rectal stricture is rare in infants, but there may be a profuse diarrhoea (Merc.). There is an enlarged spermatic cord and infiltration of the testicle. The nervous system suffers more in hereditary than acquired form. The cerebrum, pons or medulla may be involved with facial pain and loss of special senses; meningitis; as child grows there is mental dullness, loss of hearing, imbecility and even epilepsy. There are small corneal opacities; sometimes a complete opacity from interstitial keratitis; iritis and choroiditis rather infrequent; obstinate catarrhs of the ear.

What are the social rules of syphilitics?

No more important questions can be submitted to the surgeon than those pertaining to the marriage of syphilitics. Involving as it does the welfare of many individuals, modifying or fixing the conditions of one or more lives, his opinion should be exceptionally definite and well guarded. The male should not entertain the idea of contracting marriage until three years after the primary lesion and provided no specific symptoms have appeared during the third year. In the female in whom the disease is less marked, the taint remains longer, and five years should intervene between the chancre and marriage, to be reasonably certain that it may result, if pregnancy occurs, in the birth of a healthy child, when properly treated there is no reason why all should not at some time marry, but while primary or secondary manifestations are present no one with any sense of right or justice should entertain for a moment the thought of marriage. Of course, all care should be employed as to antiseptic or aseptic precautions on the part of those infected. The disease may find its entrance into the system in many ways, other than sexual congress (infected cups, spoons and towels, kissing, etc.) Therefore its presence does not necessarily indicate immorality of the person affected. With proper treatment syphilis is absolutely curable. It is the duty of the physician to tell his patient the truth as to the nature of the disease, and in case of failure or refusal on his part to inform his wife, the doctor must.

Give in full the treatment of syphilis.

Prophylactic: Surgeon should not operate or examine a case without intact epidermis. Cover any abrasion with collodion, olive oil or a bandage. Morality should be considered.

Hygienic and Dietetic: Excesses of all kinds, physical or mental, must be interdicted; out-door employment and recreation are to be recommended, as well as short vacations in the country; the diet should be regulated to give the greater amount of nourishment and at the least work to the digestive apparatus, which is frequently somewhat impaired. Hence, it must be simple and non-irritating in character with meals at regular hours. Red wine is a valuable stimulant. Cod liver oil in its various forms is of great benefit in building up the

constitution. During treatment bathing must receive proper consideration, one or two Turkish baths weekly and sulphur or alkaline baths are of great benefit. Cold plunges in the morning are frequently productive of shock to the system and weaken the body instead of strengthening it. Sleep should be regulated so that patient shall have enough. In every case the use of tobacco must be prohibited. If smoking and chewing are not discontinued, lesions will appear upon the mucous membrane of the mouth and throat, causing much pain and annoyance. Proper clothing should be worn, not too warm causing fatigue or two light allowing chilling of the surface, hence, flannel should be worn at all times. Rough teeth must be smoothed to prevent abrasions. Give recreation to mind through medium of theatres, etc. In all things moderation must be the rule; if restrictions are too rigid, the patient feels uneasy and discouragement often follows.

Medicinal: Of remedies many have had their rise and fall, but only two, mercury and iodide of potash, have stood the test of time and science. (1) Mercury, alone or in combination, is indicated in most all of the secondary and many of the tertiary symptoms and under certain conditions in the primary stage. It is universally used, but the dose and mode of administration vary greatly. Hahnemann says mercury is the specific for syphilis. It is then homeopathic to the disease and is also a tonic; increasing the number of red blood corpuscles, accelerating the pulse and promoting the excretion of urea. It can be used in any form, pills, emulsions, vapors or solutions. The patient must stop smoking, have teeth and mouth in good condition, then mercury is given as follows: The proto-iodide is considered the best, in tablets or pills of 1-100 gr. each. One (1-100 gr.) tablet twenty minutes after each meal for three days; on the fourth day add one tablet to dose given after the main meal of the day; continue this for three days, and on the seventh day add another tablet after any other meal or at night; continue this for another three days, on the tenth day adding another tablet to the dose after the remaining meal. Continue in this manner, adding one tablet (1-100 gr.) daily, being careful as to food, drink and exposure until patient has reached his limit of tolerance, as indicated by the physiological effects: (a) Increased salivation, (b) Blue line on gums, (c) Colicky pains, (d) Diarrhoea. Do not increase the dose, but continue the full dose until the secondary symptoms have yielded. If the medicinal symptoms continue give ⅛ gr. morphia hypodermatically to control the bowels. One-half of this dose is the tonic dose, which must be continued unceasingly, month after month. Should any symptoms of syphilis appear the full dose may be given until they yield. The difference between the full dose and toxic dose is known as the reserve dose. Some patients cannot take the proto-iodide, so try bichloride of mercury in doses of 1-50 gr. each, increasing as with the proto-iodide. If this is not borne well give calomel in powder or mercury bichloride in solution (1 gr. to 6 oz. of water) a teaspoonful after each meal, increasing gradually as in tablet form.

Mercury Inunction: Given where the stomach does not bear mercury well. Sometimes used as an adjunct to internal administration. Gives a quick action to the drug, yet not advised. May be beneficial in deep seated lesions, scaling conditions of hands and feet, or local conditions in general. Use the blue ointment ½ dram- at dose. Macerate it in the palm of hand, select some spot well supplied with lymphatics or the axilla, neck or inner aspect of the thigh, apply at one place only at a time. The amount of ointment to be used should be divided into several parts and firmly and evenly rubbed into the selected region, combining friction and massage; the usual time required for each inunction is about twenty minutes. If no dermatitis appears continue until mercurial symptoms attend, then stop. If a dermatitis or mer-

curial eczema appears use corn starch and try inunction in another place.

Hypodermics of Mercury: Should not be used as a routine treatment, though they are beneficial in many cases. Objectionable from the pain, possible abscess formation and injury to vessels. Sterilize the spot and also syringe and inject 30 minims of solution; 25 gr. of salicylate of mercury to one oz. of benzol.

Fumigation has its advocates; its sphere is for emergencies only and not for continuous treatment. Black oxide of mercury 30-60 gr. (volatilized) is used. Some use cinnabaris. The heat and steam soon induce free perspiration, and the mercury is deposited upon the surface of the body, the patient sometimes being allowed to breathe the fumes well mixed with air. These baths are best taken at bed time, but never immediately after a meal. Fumigation should not be given daily; every second or third day usually gives the most satisfactory results. Is slow to produce salivation, but gives a "mercurial trembling."

Mercurial Salivation: From excessive salivation the teeth may drop out, gums ulcerate and even jaw necrose. Antidotes: Atropine 1 gr. to water 1 oz., 15-20 minims hypodermatically every 2-3 hours. Hepar is the antidote for salivation per se, ½ gr. permanganate of potash to 4oz. water may be gargled as a disinfectant. For offensive breath give: Rosewater, 2 oz.; alum, 1 dr.; honey, 1 dr.; water, 2 oz.

(2) Potassium Iodide: This is another remedy that has served well and cured many of the late manifestations of syphilis. It is agreed that the best results are obtained as a rule by the administration of the drug in appreciable doses, gradually increased. It also acts as a tonic and has special affinity for broken down tissue. Potassium iodide is given in syphilis to subdue the symptoms while mercury acts against the virus itself. It is generally given well diluted in water or milk as the stomach takes poorly to its administration. It is indicated when, (a) The chancre is phagdenic, (b) Skin lesions are pustular or tubercular, (c) Deep destruction of uvula and gum borders. (d) Syphilitic dactylitis, (e) Lesions are distinctly gummatous (f) Any nervous type of syphilis.

Doses: Use 5 drops of a saturated solution, 20 or 30 minutes after each meal; 5 additional drops daily, continue until iodism appears.

Iodism: Gastric distress, colicky pains, nervous irritability, great depression, involvement of bowels, skin eruptions and ptyalism. When these symptoms occur, divide dose and keep patient upon tonic dose. If still not tolerated may be combined with pepsin or nux vomica. If not borne at all try iodide of starch, strontium or sodium. May have to be administered by the rectum.

(3) Combination: Mercury and potassium iodide may be used in combination where there are both gummatous and superficial lesions. The mercury is then given by inunction, hypodermatically or by the mouth.

(4) Other Remedies: Arsenic is good in the skin lesions, especially the squamous syphiloderma. Sulphur (high potency), is used in the pustular syphiloderma. Thuja, for condylomata; nux., in gastric disturbance; cedron, in neuralgic affection; bell, in pains darting in character; mezerium, for bone pains; nitric acid, in lip, tongue and nasal membrane lesions; sulphuric acid, in deep bone lesions; aurum, in brain syphilis with suicidal tendency and caries of nasal bones; hyoscyamus and silicia in special cases only.

Give the treatment of special syphilitic conditions.

Pregnancy: Tendency to abortion severe. The mixed treatment preferable and must be continued through a number of successive pregnancies, because if neglected, it will result in syphilitic off-spring. Give mercury by inunction and KI in solution.

Inherited Syphilis: The child must be nursed by the mother if her health is good (Collie). If possible give mercury per oram in solution (doses 1-100 gr.), but if the stomach is in a specially depraved condition it is better to use mercurial inunctions. An abdominal pad smeared with a 2 per cent. preparation of mercury is a good method. Diarrhoea is the danger signal. In late lesions merc. and KI. in combination.

Chancre: Shows the presence of syphilis, unrecognized in body, and not a forerunner that syphilis is to follow. If annoying, dust with acetanilid or iodoform. Lotio niger on lint two or three times daily. Disappears upon administration of mercury internally more quickly than by local treatment.

Adenopathy: Apply spica bandage to act as pressure. Mercury by inunction; when there is suppuration. Later, incision, curette and pack.

Skin Lesions: If early may need no other treatment, or simply belladonna; in recurrent lesions, arsenic; 1 dram. white ppt. of mercury to ounce of lanoline for troublesome lesions; 20-30 gr. merc. ox. flav. to ounce lanoline when tubercular lesions; calomel, cinnabar, bismuth subnitrate and corn starch, talcum or lycopodium powder also used.

Mucous Membrane Affections: Come early and remain late. Are often caused by tobacco or carious teeth; hence, remove cause. For superficial lesion $AgNO_3$ (5 gr. to oz.), while in the gummatous or tubercular syphiloderms, cauterize with stick of $AgNO_3$, or give a calomel bath drawing the fumes into the mouth. For the nasal membrane use permanganate of potash (½-¼ gr. to oz.), locally. In infants wash out crusts with peroxide of hydrogen and $AgNO_3$. Local mercurial inunction at times beneficial.

Bone Lesions: Potassium iodide internally. In necrosis and appearance of an ulcer apply concentrated sulphuric acid with a glass rod, packing the cavity with boric acid or gauze. In chronic slow-healing ulcers make an incision and curette the edges. For dactylitis, onychia and paronychia use iodoform or bichloride 1-1000 or 1-2000.

Visceral Lesions: Iunction cannot reach them. Give hypodermics of mercury salicylate; push potassium iodide unceasingly. KI. is indicated in gumma of the testicle. In general enlargement a mixed treatment or mercury by inunction.

Eye Lesions: For conjunctivitis, an eye shield. Mercury by inunction and belladonna internally. For iritis atropine or scopalamine. For choroiditis, atropine. For deep lesions, mercury by inunction or hypodermically.

Ear Lesions: No special treatment. Hg. by inunction.

BURNS, SCALDS AND FROST BITES.

Describe the difference between a burn and scald.

A burn is a skin lesion from the concentrated application of dry heat.

A scald is a lesion from moist heat or a corrosive fluid.

A burn may destroy hair follicles, but usually scalds will not.

What are the three stages of burns?

1. Hyperaemia; swelling, redness, discomfort or pain. Passes off in 24-48 hours.

2. Inflammation: In addition to above, have an inflammation of deep skin tissues. Vesicles or blebs containing excoriating fluids, are formed.

3. Production of a slough or eschar: Still deeper tissues involved, with accordingly graver symptoms.

What are the prognosis and effects of a burn?

The damage from dry heat may be considerable, depending upon the extent of surface covered, location, age and habits of patient. Burns of more than one-quarter the body surface are usually fatal. Drunkards do not rally well. Children often die suddenly in convulsions. Adults may have uraemia or nephritis as complications. The number of red blood corpuscles is said to be diminished; noxious principles as hydrocyanic acid, etc., are formed, a severe shock to nervous system is experienced. There is the formation of an embolus and ptomaine poisoning. Respiration is also arrested.

What are the symptoms of a burn?

In burns of a greater degree there is a shock which is severe and long; temperature, subnormal, 97 degrees or less, respiration shallow, dilatation of pupils, great thirst, pulse weak, but mind remains clear. In 36-48 hours a reaction; rise of temperature, pulse full and bounding; complications apt to arise, as pericarditis, meningitis, nephritis, albuminuria, coma, convulsions and death. If patient survives the second stage, a marked deformity from cicatrices is to be feared. Septic matter is apt to enter the wound, hence, use strict asepsis and skin graft early. A keloid may last for years, often epithelioma occurs.

Give treatment of burns.

In those of first degree, apply molasses and bandage or rye flour. Always use a gauze bandage. In second stage, when depression occurs stimulate with strychnia or digitalis. Even whisky good. Locally, open the blebs and dust with an antiseptic powder, repeating as often as necessary.

In the third stage, stimulate vigorously, give rectal enema, salt infusion often needed. Locally, open all blebs and render aseptic. Keep from air, apply lotions; linseed oil, boric acid, castile soap, gauze, cotton and bandage. Cautharis internally.

Describe frost bites.

Are caused from severe cold which interferes with the circulation. Ears, lips, fingers and toes are oftenest affected.

First stage, hyperaemia, swelling and redness. Second stage, vesication, deep red or bluish color. Third stage, gangrene from arrest of circulation.

Treatment. Snow or ice, then tepid water, dry heat, then hot water, thus generally working up the circulation. Avoid sudden application of heat. If a shock stimulate vigorously.

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